

JOANNIS KEPLERI

ASTRONOMI

OPERA OMNIA.

VOLUMEN TERTIUM.

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EDIDIT

Dr. CH. FRISCH.

VOLUMEN III.

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ASTRONOMIA NOVA

SEU

DE MOTU STELLAE MARTIS.

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PROOEMIUM

[illegible] opere Kepleri, quod exhibet studiorum septennalium pro- [illegible] continentur, ipse proponit auctor cum in prae- [illegible] indice, quem praemisit locupletissimo. Fundamenta in [illegible] vere „novae," legislatorem se praebuit per omnes [illegible] suo astronomis praeluceutem. Nemo unquam, qui [illegible] ingressurus est, non perlustrabit hoc immortale [illegible] capacitatis et industriae humana majoris. Quodcunque [illegible] astronomorum, nullum deprehendimus, in quo [illegible] inventionum, quas prodit Keplerus in „Commen- [illegible] procedendi rationis. Omnes in illis consentiunt, [illegible] omnes aeque ponderent hanc ipsam rationem et con- [illegible], quae Keplero in perficiendo hoc opere impe- [illegible], parum cognoscentes viri ingenium, forte etiam [illegible] inventiones Kepleri quasi fortunae tribuunt. [illegible] excellentem ingenii bonitatem [illegible] [illegible]

erroribus, at unus fere tum temporis agnoscebat illius hypothesin; Tycho ipse tantum abfuit, ut transiret in castra Copernici, ut nova constituta hypothesi rem implicatiorem reddiderit; Maestlinus et alii plerique, cum quibus per literas egit Keplerus aut qui publici juris fecerunt opera astronomica, variis moti causis verebantur plane et plene transire in partes Copernici. Quare non tantum abjicienda et corrigenda erant, quae in Copernico falsa cognoscebantur, sed etiam Ptolemaei placita, aequalibus ex parte acceptissima, certe familiarissima, evertenda. Theoria epicyclica et eccentrica impugnanda erat, bellum denunciandum omnibus fere in astronomia tritis et stabilitis opinionibus. Quam pugnam iniit Keplerus imperterrito animo solus, non adjutus [illegible] impeditus ab amicis et vicit novam constituens astronomiam, quae ut diximus ratio et norma est astronomis posteriorum seculorum.

Quae in contrariam partem attulerunt astronomiae prioris asseclae, luculentissime apparent e literis Davidis Fabricii ad Keplerum scriptis dum opus suum excolebat, quas desumtas e Manuscriptis Petropolitanis praefationi nostrae subjunximus. Quae alia impedimenta [illegible] sequentes exhibent paginae.

Plerisque eorum Kepleri operum, quae continent volumina priora [illegible] editionis, argumentum quam brevissime praemisimus. Quam si in [illegible] eadem ferme ratione qua in Optica exhibuimus, accuratius [illegible] diximus, causae non minus, quam res ipsae, quae paucis verbis explicari [illegible] Quam ob rem statuimus, ordine procedere chronologico, exhibit[illegible] continent scripta a Keplero relicta non typis impressa et Han[illegible] larum collecta, ut quantum fieri potuit speciem et formam [illegible] studiorum, quae Keplerus ad perficiendum hoc opus [illegible] prodierunt ex [illegible]

[illegible] quas Imperator Rudolphus ipsi mandaverat, [illegible] quae dubia ipsi occurrerant in theoria [illegible] institute, inquirens, atque [illegible] propositiones [illegible] potuit. [illegible] jam eo tempore, quo apud Tychonem versatus [illegible], patet e literis ad Maginum (Cal. Jun. 1601). [illegible] rerum domesticarum causa Graecium reversus esset, [illegible] sibi convenientem deprehenderat, quam ob rem [illegible] ille [illegible] sublevaret (vide infra). Proponit [illegible] quam exhibet fere eandem in Commentariorum [illegible] his me demonstratione juvare possis." [illegible] astronomiae Magino haec proponit: 1) Planetarum [illegible] Aut hactenus creditum est ad medium, sed ad [illegible] 2) inaequalitates inferiorum planetarum prodeunt e [illegible] planetariarum orbitarum constantissima sunt. [illegible] forma est eadem, quilibet circulum [illegible] 3) Datis tribus acronychiis observatio[illegible] distantia Solis et Terrae et inde distantia planetae [illegible] quibus sitibus planetae acronychiis determinari [illegible] probata, sed probabilia tantum et [illegible] in literis illis ad Maginum datis [illegible] Tycho, „nimis [illegible] quid [illegible] si apud ipsum Pragae ad [illegible] Maginum scripsit, quia a Tychone [illegible] etiam ad Maginum [illegible] de[illegible] commentarium [illegible] Sed [illegible] quasi [illegible] Keplero [illegible] 1640, [illegible] Commentaria Martis [illegible] Keplerum [illegible] literas, [illegible] Ephemerides [illegible] [illegible]

[illegible]

Davidis Fabricii et Kepleri epistolis [illegible] tempore, quantum ipsi licuit per alias occupationes, [illegible] rejecisse, sed semper animo [illegible] propositum [illegible] in [illegible] taret astronomiam. In literis d. 18. Jul. 1602 (deperditis) [illegible] Keplerus, quae leguntur in literis ad Maestlinum [illegible] Maginum [illegible]; [illegible] pluribus explicat in sequentibus (d. d. 1. Oct. et 2. Dec. 1602). [illegible] epistolae conclusio „parum mihi otii est, dum [illegible] opticam" confirmat ea quae diximus, Keplerum tum temporis [illegible] nondum toto animo et studio omni incubuisse; quamquam [illegible] illis ad Fabricium datis literis constantia viri [illegible] suscepto negotio. Eadem testantur literae Kepleri ad Herwartum [illegible] anno 1602, in quibus refert Keplerus, „per [illegible] inquisivisse, et satis bene rem successisse. Anno 1603. (5. Jul.) [illegible]: „in theoria Martis cetera sunt expedita, verba [illegible]" [illegible] 4. Julii Fabricio scripserat) motuum Martis inaequalitatem [illegible] hypothesin, [illegible] deesse sibi ad [illegible] geometricum [illegible] [illegible] sectionis in data ratione. [illegible] (tum temporis medicum Onoldinae, postea medicinae professorem [illegible]) [illegible] anni 1603, [illegible] in literis ad [illegible] Donauverdae) Jan. 1604. datis, pluribus de Martis [illegible] Keplerus, [illegible] [illegible]

[illegible]

[illegible] et particulam [illegible] [illegible] [illegible]

[illegible] Sole [illegible] et [illegible] motibus impediuntur [illegible] quidem [illegible] literarum harum fuerim recordatus, an potius [illegible] in- [illegible] mihi methodo et [illegible] compendium [illegible] in Marte [illegible] Kepleri quidem [illegible] ad [illegible] quid [illegible] in his quoque Keplerum de studiis [illegible] [illegible] Kepleri [illegible] ad promo-

[illegible]

[illegible] opus [illegible] perficiebatur, ut in literis ad [illegible] Tubingensem [illegible] Commentaria Martis apud [illegible] Debilitata autem valetudine [illegible] In [illegible] Fabricium iterum recenset labores suos in eruendis [illegible] obstabant; formam [illegible] orbitae planetae [illegible] ovalem, falsam esse, ergo mutandam [illegible] Martis perfecta [illegible] ellipsin. Ceterum [illegible] inquisivisse, [illegible] vero Commentariis [illegible] falsam [illegible] hypothesin, [illegible] invenisse, [illegible] negotii.

Anno 1605 refert Keplerus [illegible] Martis [illegible] plane planeque demonstrare posse, [illegible] cubitos 5 [illegible] Certum [illegible] quae planetas rapiat; [illegible] mense Maji 1606 [illegible] Martis [illegible]

[illegible]

Commentaria [illegible]

[illegible]

... Quos praeter hos duos et forte M. Seiffardum ... Keplerus ad calculos suos adhibuerit, non constat. ... 1609 cum Keplero convenisse, ... vol. II p. 572. ... Keplerus Herwarto d. 15. Jan. 1608 addit ... sibi stimulus non accedit per publicationem, ... Fabricio (d. 1. Aug. 1607.) Commentaria ut ... impediri minatur Tengnaglius; denique Brenggero ... Comm. de motibus Martis ... Exemplarium ... interdictum. Quaerenti Brenggero, quid haec ... Keplerus (Apr. 1608.) opus publice venale ...

... desumta sunt de tempore quo ad finem ... addimus testimonium publicum, quod Carolus ... publicis, desumtum primum publici ... 1657). Die 29. Dec. 1608: haec ... An den edlen Helmharten Jörger zu Tollet und ... Erblandthoffmaister in Oesterreich ob ... und Obristen Profiantmaister: ... Gottes gnaden, Erwellter Römischer Kayser, zu ...

... Uns hatt noch für zwey Jahren unser Mathe... Keppler ein Astronomisch Werk, genannt ... Stellas Martis allerunterthänigist praesentirt, Welchs ... beschaffen zu sein befinden, dass es zu ... werth.

... wir, zur erweitterung unserer und unserer hoch... Oesterreich angewohnten lieb, zur befürderung ... Buch, darinnen, soviel herrliche ... Alss haben Wir ... zu truckh bringen zu lassen, Idoch ... Exemplar ...

Welgeborne Edle und Gestrenge Gnädige [illegible] E. E. G. G. Werden sich Wissen zu erinnern [illegible] vor einem Jahr Vnd darüber, ein buch, auch Wällischen [illegible] mir anfänglich mein bestellung gemacht, in druckh [illegible] anbefohlen, vnd mir darzue eine summa gelts durch die [illegible] lassen. Demnach aber Ire Mt. ferners von mir underth[illegible] worden, das mein Truckher, mit Wällischem Ich contra[illegible] gewiss Exemplar Stükhe vnd gelt, ein so lange Zeitt [illegible] Franckfort andern geschäfften abwarte, Haben Die mir A[illegible] eine raise dahin zu thuen, vnd sollichen Truckh mainst zu [illegible]

Weiln nun E. E. G. G. Hochvernünfftig zuerachten, das Ich [illegible]liche ferne raise ohne Zehrpfenning, vnd versorgung meiner [illegible] Hauswürtschafft nit verpringen khünde; zumall Ich dise Zeit [illegible] sach sich verzogen, in abgang der Hoffzallung das [illegible] Mt. mir auff druckhung dises buchs verwilligte gelt, anders [illegible] notdurfften zu guetem Theil verwendet, Alss gelangt an E. [illegible] gehorsame bitt, die Wellen mir zu gehorsamisten [illegible] tuirung Ires Kay. Mt. Allergst. Willens vnd [illegible] Werkhs, wölliches verhoffentlich Iren K. Mt. zu einem [illegible] eine Jahrsbesoldung auss dem Höffzalampt [illegible] gewinnung der Zeitt) anstellen lassen [illegible]

E. E. G. G. mich zu gnädiger [illegible]

E. E. G. G.

underthänig [illegible] gehorsamer [illegible]

[illegible]

[illegible] 52 (Martio 1605) et maxima ex parte impetatis [illegible] hic capita 52—58 mense Majo, reliqua, forte usque [illegible] 1605; pars denique ultima (cap. 61—70) per [illegible] computationes eam accepisse videtur formam, quam [illegible]. Ceterum e literis ad Herwartum datis (Jan. 1608), [illegible], apparet, jam illo tempore de capitibus 58 et 68 [illegible]. Ad typographum Lipsiensem transmissum est opus [illegible] Septembri anni 1607, typi lignei Frankofurtum [illegible] denique exscribi coeptum sub finem anni 1608. [illegible] est d. 4. Apr. 1609. et typus finitus circa Julium vel Augu-[illegible] Harrioto de „commentationibus astronomicis" respondit [illegible] commentaria de Marte, titulo Astronomiae novae [illegible] Coelestis, prostant jam Frankofurti. Exem-[illegible]

[illegible] tum [illegible] opus [illegible] publici juris fecerit, et per [illegible] quaerendae sunt in capitibus [illegible] se [illegible] dedit. Parum dubium quin, sicut in [illegible] typos operis curaret, cum Keplerus [illegible] jam ante [illegible], et Keplerum minime laterent angustiae aerarii [illegible] dicti typi alibi quaerenda est, [illegible] („Tychonicos") [illegible] sunt. — Tychone mortuo Keplerus [illegible], ut ea quae ipsi viderentur ex manuscriptis Tychonis publici [illegible] potquam [illegible] hoc [illegible] [illegible] Progymnasmata, quod apparet ex [illegible] Kepleri ad [illegible] Mireberis de mendis in textu (Pro-[illegible] curiosus haeredibus visus fui in alieno [illegible], ut ideo me ad typos corrigendos non [illegible] opera studiosi Joh. Eriksen quaedam muta-[illegible] dum praecipitantur omnia, nec me [illegible] et juridicas actiones [illegible] ingerere [illegible]

[illegible]

ego et olim et jam, vivo et conscio Tychone, Copernici sequor hypotheses. Itaque aut diversum ab eo quod sentio in philosophia defendendum, [illegible] Tengnaglio discedendum erit, quantum prospicio. Atque illud [illegible] nec porro admittam; hoc ita faciam, ut dissidere, non odisse [illegible] idem et ille sit facturus nescio. Tomos observationum [illegible] perceperem; quam vero spem tibi de Tengnaglii voluntate [illegible] Mihi certum est, etsi imprimantur haud facile repertum iri, qui [illegible] tabulas conficiat, nisi extreme impudens et famae negligens; [illegible] illi aqua haerebit quicunque laborem susceperit. Utrum idem et [illegible] sit persuasus, nescio. —

Causam hic habes dilatae editionis Tabularum Rudolphinarum [illegible] temporis spatium (prodiisse anno demum 1627 constat), [illegible] alias multas difficultates, de quibus alio loco agendum erit. Tengnaglium vero [illegible] fuisse huic negotio, elucet ex Kepleri verbis, quibus respondit Herwarti [illegible] [illegible] Tychonis Brahei haeredes [illegible] [illegible] (K. literis d. d. 6. Jan. 1602.) Quod haeredes attinet [illegible] unus est instar omnium Franciscus [illegible] nobili genere Westphalus et in praesens Caesareae [illegible] aulicus; mathematicus enim non vult audire. Nihil [illegible] M. Tuae impense.

[illegible]

... constare mihi non potest, quia me Tengnaglius ... nec foenum ipse comedit nec aliis indulget. ... Hic vellet, me meis inventis ipsius salarium tueri, ... de suis mille mihi transmitteret, communi ipsius ... meis coram Caesare comparere. Sed quia ..., ego quoque non possum pro his mille spondere ... salarium defendere: quod et feci traditis Opticis, ... transformatione tabularum Lunarium Calendis Januarii. ... quaerit, me Tychonis placita convellere, nolle ... (In margine: Quid tu Fabrici? Lunaria Ty- ... umbrae Terrenae metatorem, nullam concedunt dimen- ... Terrae distantiarum et proportionis corporum. Hoc ... observationes, ut correctio a Tychonicis ipsis proficis- ... observationes. Hoc est Tychonis placita convellere.) ... me impediri, ut tempus habeat aliquid elaborandi; ... profectum, sed hoc valde inconstanter, subinde ... non esse unam professionem.

... jure, me nihil in ipsum aut ipsius salarium ten- ..., ut observationes habere possim quas cupio, deinde ... veritatis defendam contra disseminatas criminationes; ...r. Acceperunt de 20000 partem quintam; de reliquo ... duxit genere nobilem, fortuna tenuem. —

... quae Longomontanus ad Keplerum et Keplerus ad He- ...

[illegible] edidit, [illegible] ex parte quidem [illegible]. [illegible] mathesoos in academia Altorfina, qui dum munere hoc fungebatur, anno 1624 [illegible] Keplero: anni sunt 18, ex quo tempore ego Pragae [illegible] Rob. [illegible] in [illegible] supputationibus, motum, ni fallor, Martis concernentibus [illegible] operis illius contuli, quod post obitum meum paulo post [illegible] audivi, est quod mihi gaudium [illegible] superesse [illegible] potendi dono mihi oblatum. Librum quidem illum antehac [illegible] temporum injuria vetat, quo minus tolerabili aliquo pretio [illegible] Alio tempore dabitur forte illius procurandi occasio. — Keplerus ipse in [illegible] Cop. haec dicit: Undecimus est annus, ex quo Commentaria mea de [illegible] stellae Martis edidi. Qui liber, cum in pauca multiplicatus [illegible] plaria, doctrinamque de causis coelestium inter spineta numerorum [illegible] apparatus astronomici velut abscondisset, cum et pretio libri [illegible] absterrerentur, visum est amicis, recte me et ex officio facturum, [illegible] conscriberem &c.

Literas [illegible] Keplei [illegible] earum [illegible] accedunt.

Manuscriptorum Pulkoviensium volumen XIV, folia plus quam [illegible] Keplei ad Martis motus indagandos. Opus ipsum [illegible] tione quadam excerpendi. [illegible] Prima [illegible] epistolae Keplei fragmentum, ad theologum quendam [illegible] R(everendissime) D(omine) P(ater) [illegible] quae mente Keplerus agitabat conscripturus [illegible]

Epistola haec est:

S. P. D.

Obsecro majorem in modum, ut R. D. P. ea, quae hic [illegible] sophica, cum metaphysicis, ut illa dicuntur, [illegible] in scholis [illegible]

[illegible]

[illegible] physica de motibus stellarum.

[illegible] aut vi motrice aut nutu. Ex 3. et 11.

[illegible] Ex 2.

[illegible] non sufficit. Ex 7.

[illegible] vi naturali [illegible]

Ex 10.

[illegible] primario ἀντιπνακει ponderum, aut vi motrice con-

[illegible] corpore [illegible]

[illegible] a fonte, seu effluxu.

[illegible] et remissio per elongationem.

[illegible] inaequalis in motu. Ex 7.

[illegible] et mobile, etiam temporis ad spatium proportio.

[illegible] est et amplitudinis [illegible] proportio [illegible] medii

[illegible] seu [illegible]

[illegible] terminorum.

[illegible]

[illegible] nulla est consideratio medii et temporis. Ex 4.

[illegible] undique aequabilis, ac rotunda.

[illegible]

[illegible] Ex 16.

[illegible] esse in avers[illegible]

[illegible]

[illegible] et in [illegible] momento

[illegible] Ptolemaicas.

[illegible]

[illegible] in aphelio et perihelio, quod invento

[illegible]

[illegible]

42. Epicyclus [illegible] mixta vi propria et nutu.
43. Vis naturalis [illegible] est.
44. Epicycli motus non est ex nuda vi naturali. Ex 43. [illegible]

Praeparatio ad Commentaria in Theoriam [illegible]

1. Brevis excusatio, cur veritas historiae minutatim consectanda [illegible]
2. Occasio adventus mei in Bohemiam et suscipiendi hunc laborem.
3. Tabulae Solis Tychonicae, cum distantiis Solaribus ex Progymnasmatibus [illegible]
4. Tabulae oppositionum mediarum ♂ et ☉.
5. Tabulae ♂ inde exstructae.
6. Quae in aliis locis occurrunt conceptiones de ♂. Ut exemplum in [illegible] Rudolphi. Relatio in Mechanicis, in libro Epistolarum ad [illegible] in epistolis ad Maginum, quia is prior mentionem injecerat in [illegible] Item ex libro de cometa a. 77, quod pendeant omnes orbes [illegible]
7. Examinatio reductionum ex certis observationibus ad momenta [illegible]
8. Examinatio motuum mediorum ♂ et ☉, competentium [illegible] oppositionum mediarum ♂ et ☉.
9. Examinatio prosthaphaereseon, seu locorum verorum eccentricorum [illegible]
10. Demonstratio, quibus angulis usi sint in reductione ad [illegible]
11. [illegible] uti debuerint, et quanta hinc existat [illegible]
12. Physica demonstratio, quod reducenda sit haec tabula ad verum ♂ [illegible] ex meo Mysterio.
13. Causae, cur in computandis locis eccentricis Tycho a vero non recesserit [illegible] h. e. aequipollentia hypothesium.
14. Demonstratio, quod [illegible] si altera [illegible]
15. [illegible] oppositiones [illegible]
16. Ex datis Tychonicis circa oppositiones [illegible] ad suppositionem verarum [illegible] Ptolemaicis, et motus [illegible]
17. [illegible]
18. [illegible]

24. [illegible] correctas distantias [illegible] singulos, [illegible] et artificium aequatoriale [illegible] ad gradus [illegible]

[illegible] Ptolemaica, quod prosthaphaeresis Tychonis [illegible] turbentur.

[illegible] eccentricitatis, dimidiae in Sole, ut simul ne aequa- [illegible] credere cogamur, quam supra cap. 18. suspectam [illegible] Ubi, quia [illegible] nobis opus est, duplicibus illas curvas docebimus, [illegible] anguli, vel per conum scalenum, [illegible] in [illegible]

[illegible] jam constitutis, vice versa [illegible] eccentrici loco, addita, quantum fuisset erratum, [illegible] vel pars notabilitur major fuisset accepta. [illegible] falsi, aut demonstrative, ut in ☿, rursum [illegible] Terrae.

[illegible] exemplaria [illegible] in ♂ et ♀ [illegible] de ceteris planetis ingredimur speculationem physicam [illegible] motus, ut [illegible] distantiae [illegible] compendium tradere investigandi.

[illegible] et computatione locorum in tabula ♂. [illegible] consentiat cum axiomate: „ita motus, ut distantiae," [illegible] facile probabitur.

[illegible] ♂ [illegible] est, consulemus aliquot obser- [illegible] circa perihelium, et tam diu [illegible] tempore [illegible] in loca opposita, [illegible] distantia et [illegible]

[illegible] in ♂, [illegible] desunt obser- [illegible] in loco quadrato ex [illegible] de eccentricitate [illegible]

[illegible] de novo recoquenda ad numerum [illegible]

Cap. 32. Virtutem [illegible] planetam movet in circulum [illegible] quod est apud centrum illius circuli, et quomodo [illegible] comparatur luci et magneti, et [illegible] et quasi [illegible] et quomodo comparata sit; denique de [illegible]

Cap. 33. Virtutem motricem [illegible] geometrica.

Cap. 34. Consideratio metaphysica virtutis ex Sole. De [illegible] eorum cum luce. [illegible] species immateriata. [illegible] Impediri potest.

Cap. 35. Virtus Lunam movens, qui comparata sit. [illegible]

Cap. 36. [illegible] ex 2 [illegible]

Cap. 37. [illegible] Ubi [illegible] epicyclum, [illegible] Solis [illegible] epicyclum.

Cap. 38. An [illegible]

Cap. 39. An [illegible] de [illegible]

[illegible]

vitio et prae[…] calculi, seu quacunque alia ratione. Cum igitur etiam per se ipsum suspectum sit, assumere quantitatem […] dimidiam eccentricitatis totius, erit igitur ante omnia ho[…] sione tentandum, quam hactenus a me factum est.

Hoc fundamentum erit omnium quae porro in Marte […]. Ubi de quantitate convenerit, construatur postea tabula ad singulos gradus ab apogaeo Solis, exhibens distantiam Solis a Terra. Simul etiam videantur aequationes eccentri Solaris, quae circa 45° ab apogaeo mutabuntur (si dimidia sit eccentricitas nova antiquae) unius scrupuli quantitate circiter.

Jam quod ipsum Martis eccentricum attinet, in eo primum aequationes non bene habent. (In marg. Haec demum die paschatis) Deinde […] proportio circellorum. Nam *ἀκρονύχιαι* observationes habent hoc vitii, quod reductio locorum eclipticorum ad orbitam ♂ facta est per […] maximam boream et austrinam, quae debuisset fieri tantum per angulum inclinationis acronychiae. Hoc pacto 10' alicubi sunt addita, ubi non […] fuisset addendum. Itaque exsurgit ex comparatione dextri et sinistri circuli differentia circiter 20'. Quodsi de novo struantur prosthaphaereses, apogaeum quidem aut eodem loco manebit, aut parum admodum […], at variabitur proportio circellorum, forsan et ipsa aequantis […] nonnihil […], sic ut maximae aequationes fiant […] minores. Manebit apogaeum ideo, quia nodi sunt fere in […] mediis, et sunt aequalia et nodis aequalia per reductionem […] sunt addita. Mutabitur aequatio maxima propterea, quia […] jam dictam Mars […] et ad apogaeum et ad perigaeum […] admotus, quam re vera erat. Conditio vero circelli hoc […]

[illegible] Solis, aut C centrum aequantis antiquum, vel non [illegible] tunc utique centrum viae planetariae [illegible] non poterit amplius esse in D, [illegible] sed cadet necessario in F, punctum lineae CB [illegible] Martis ad dextram loco suo movebitur. Etsi [illegible] D, vel si F sit centrum eccentrici, semper iidem [illegible] ad C constituentur: tamen cum ♂ tantum [illegible] circa F currens, aequaliter utroque modo ab A [illegible] locis omnibus, alias per D centrum, alias [illegible] aliqua parallaxis. Nam linea DE cadit [illegible] opposito ostendit maximam distantiam orbi- [illegible] locum ♂, et in una et in altera orbita [illegible] duae lineae nondum maximum angulum [illegible] non sunt maximae. In longitudine vero media [illegible] orbitarum ♂ distantia, fit angulus dictus [illegible] circiter 5'. In parallaxi vero annua 42' vel [illegible]

[illegible] parallaxes annuae locis ex hac specula- [illegible] possint ferre? Quod etsi nondum [illegible] nequaquam dubito. Nam hoc evidentissime [illegible] modo considerantis apparet. distantias [illegible] nodorum ad ipsum corpus Solis, [illegible] quod etiam experiendum erit, an esse possit) [illegible] circa 24 ♀. Idque pulchre cum trian- [illegible]

[illegible] distantiarum Solis et Terrae. post aequa- [illegible] ad investigationem proportionis [illegible] certissimo constat, tamen [illegible] 1:1580, [illegible] 1:1160 circiter; [illegible] de Solis [illegible]

[illegible] Sed A et [illegible]

ex subtractione visi loci a loco causa eccentrici, [illegible] quae, et FED rectus. Hinc quaeratur FD, vera [illegible] DAC (fig. 1). Hoc nisi caveatur, [illegible] inferatur, [illegible] commutationis est valde parvus, ubi latitudo se immiscet [illegible] [illegible] parte [illegible] Martis [illegible] [illegible] modo [illegible]

Qualis mea opinio futura sit de Theoria [illegible]

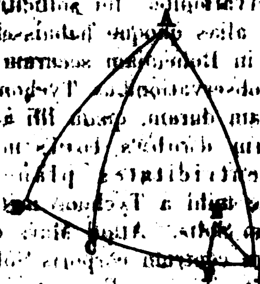
Calculatio quidem erit satis intricata, sed hypotheses [illegible] a vero loco ☉ eccentricitas tota erit circiter 18000 [illegible] 100000, de qua debebitur apogaeus et perigaeus 10670 [illegible] cadet in [illegible] 31 ½ ♌ circiter. Et addetur 58 longitudini [illegible]

Per hanc suppositionem in 8 certioribus [illegible] ultra 6' aberratur. At verus ille locus ☉, unde pendet [illegible] ♂ non tantum distat a Terra in revolutione annua, [illegible] eitas maxima. Minuitur enim illa in apogaeo et perigaeo [illegible] parte, atque sphaerae ♂ centrum (☉ in ⊕ versante) [illegible] remotius a Terra. Quod [illegible] attinet, [illegible] [illegible] enim planum sphaerae ♂ constantem et non [illegible] ad planum sphaerae ☉, circiter 1° 50' 30", et transire [illegible] per ipsum corpus ☉ [illegible]

[illegible]

... opposito loco ... corpus trans- ... modo in- ... angulum, qui ... oppositus dicebatur, ... sphaerico latus utrumque ... sphaericum rectangulum. ... GHA angulus arcui ... ♂ visa ab ... rectae. ... UA, itemdo ♂ visa, ... opposito Solis vero.

planetae; Martis scilicet, ... Fig. 8. observationibus in ... post alias quoque habita ... ueri in ... ex observationibus Tychonis ... tertiam ... eccentricitatis planetae ... valde igitur a Tychone ... locum Martis. ... ipsum ... at et sibi jam diu ... calculi, ... ante finem ... de ...



[illegible]

planetae, Martis scilicet. In hoc tempus trivi nec de aliorum planetarum observationibus fui sollicitus: sperabam quotidie exitum [illegible] Martis post alias quoque habuissem. At cum tempus elaberetur, [illegible] reditus mei in Bohemiam securum me reddidit. Igitur Mars, quantum ego quidem ex observationibus Tychonis [illegible], jam incipiebat [illegible] modulari tertiam duram, quam illi assignavi. Confirmavit idem et Mysterium meum duobus locis mirifice. Cum enim illic ego retulissem eccentricitates planetarum omnium ad ipsum corpus Solis, valde mihi a Tychone metuebam, ne is referret ut Copernicus ad medium locum Solis. Atqui Mars constanter respuebat ullum aliud punctum, [illegible] ipsum centrum corporis Solaris. Tycho laetabatur [illegible] ait et sibi jam diu agitatum, sed libenter declinaturum [illegible] calculi, eoque cupere videre et aliorum meditationes. Deinde, [illegible] sub finem Mysterii mei monuissem de aequante ☉, [illegible] lebam unico Soli vel Terrae negatum: jam ♂ apertissime [illegible] testatus est, inesse in ☉ rationem aequantis. Et hoc est, [illegible] quasi sub aenigmatis involucro (ut interdum soleo) ad [illegible] variabili quantitate orbis annui, qui in ♂ effectum [illegible] 1° 40′ (L. 62.). An igitur [illegible], dum Tycho [illegible] planetarum, ambigo. Sed tamen, si praeoccupare visum [illegible]

[illegible]

[illegible] incidit, id cito ad me perscribes, si mea studia [illegible] commendo.

Graecii 12. Jul. anno 1600.

Nob. et Magn. Tuae

Studiosissimus

M. Jo. Kepler,

[illegible] Styriam Ordinum Math.

([illegible] Edelgebohrnen Herrn Hans Georg Herwarten von Hohenburg, [illegible] Rath in Baiern, geheimen Rath, Pflegern zu Schwaben u. d. [illegible] Meinem Grossgünstigen Herrn. München.)

Postscripta.

[illegible] ad emporium quoddam doctrinarum perfrequens et [illegible] nationum sese internoscere incipiunt, mitto, [illegible] quod ad Vietam transmittes, si astronomiae [illegible] quicunque hoc demonstraverit, is mea quidem opi[illegible] absolutissimi et exquisita astronomia merebitur.

[illegible] acronychiis planetae situbus in zodiaco et tem[illegible] longitudinem mediam (iis enim, quae ab [illegible] possumus), et locum apogaei et eccen[illegible] eccentricitatis aequantis ad eccentricitatem viae [illegible] quis desideret scire, praeter parallaxes [illegible] sed indemonstrato. Itaque ad finem [illegible] Perveni quidem, sed inutile fuit [illegible] Sed scio perveniri posse) quatuor [illegible] est, seu ut ita dicam quadrata [illegible] Vietae verbo utar, quo usus est in [illegible] tribus [illegible] Vietae demonstratio spem mihi injecit, posse [illegible] Si prior [illegible] demonstratio [illegible] quidem cum fructu quaesivi [illegible] Hoc tamen certum habeo [illegible] Cum quae nota sunt [illegible] in quadratum opposito [illegible]

Oportet jam regionem circa B dividere in 4 angulos [illegible] c, d, f, e, et regionem circa A in 4 aequales datis gradibus, [illegible] ut sectiones quaternae linearum ex B et ex A concurrentium [illegible] circumferentiam ejus circuli, cujus BA utrinque continuata [illegible]. Hic cylindros et conos et quicquid est supellectilis geometricae [illegible] Apolloni Gallice. Nam facit instituta restauratio astronomiae [illegible], ut iis, quae jam demonstrasti, parum frui possimus ad majora [illegible].

Modus quo ego sum usus in opere (quia hic problema [illegible]) hic fuit. Esto circulus propositarum [illegible]. Haec est via ipsius planetae [illegible] illa stationes. Centrum ejus sit B, [illegible] puncta duo proposita (quae jam [illegible]) A centrum unde computatur eccentricitas [illegible] Sol, C centrum aequalitatis) [illegible] nectantur CD, CE, CF, CG, [illegible] AG, item BD, BE, BF, BG; [illegible] EF, FG, GD; denique GE. [illegible] ECF, FCG, GCD ex intervallis [illegible] observationum. Dantur etiam DAE, [illegible] GAD ex [illegible] D, E, F, G [illegible]

Fig. 5.



DEFG [illegible] [illegible] circumferentialis est dimidius centralis EBG, et BE, BG [illegible] [illegible]

[illegible]) Ideo hic aro, EX BE, EA notis et [illegible] HAE, qui si aequas HAE, factum est quod [illegible] revertitur, et ipsam etiam longitudinem [illegible] [illegible]que saltem [illegible] apogaeum [illegible] [illegible] in trapezio, [illegible] 2 rectis. Hoc est [illegible] utendum fuisse.

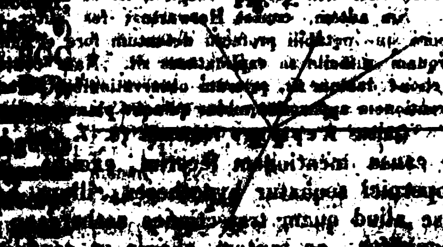
[illegible] [illegible]ionibus apud Tychonem vidi a te missum, sed [illegible] negligens ejus inspectio; hoc idem demon[illegible] in zodiaco et intervallis temporum geometrice quaerere [illegible] simplicem sine aequante, et longitudinem [illegible] usus est Tycho in theoria Solis, sed spe[illegible] duo aequinoctia. In Landgraviana de[illegible] fuisse, quas hic aliquando vidi. Inveni [illegible] Vieta cognoscere potest et, cum sua con[illegible]. Problema hoc:

Fig. 6.

[illegible] isosceles, unum [illegible] alia duo sectione [illegible] angulos habentia. [illegible] viam pla[illegible] regularem super suo [illegible] stationes B, C, [illegible] DA, item DC, [illegible] unum A ver[illegible] CD; quae, propter [illegible] [illegible] Super has [illegible] [illegible] [illegible]



[illegible]



[illegible]

Ad haec problemata Herwartus non respondit, forte etiam [illegible] Keplerus [illegible] consideretur, non satisfecit. In responsione, quam ex parte [illegible] Vol. [illegible] legimus: Ptolemaei libros Harmoniae und [illegible] Aristoxeni Harmonica [illegible] fleissig Nachsuchen gefunden. Hat solches der Bibliothecarius [illegible] nit finden können. Hab mich in Wahrheit [illegible], dass ich Euch [illegible] Büechl zuschicken konnte, und solches um so viel mehr, weil ich verhoff, [illegible] nunmehr zu eurem jetz unter Handen habenden Werk verfahren mögen.

Ich vermuthe, Es werde der Herr Brahe Euch die observationes Martis [illegible] adhuc [illegible] haben; da [illegible] also, begehre ich darvon [illegible]. Auf den Fall es aber nit wäre, were mir damit [illegible] gedient, [illegible] theoriam Martis wissen könnte.

Sonst werdt Ir noch gedenken und von Brahe selbst vernommen haben, wie [illegible] ad rectificationem veri loci Lunae ein circellum annuae variationis (in dem [illegible] so ers zu Wittenberg drucken lassen) introducirt, cujus [illegible] principio Cancri, ita ut in priori semicirculo hujus circelli [illegible] locus Lunae [illegible] consequentia, et in posteriori retrotrahatur in praecedentia. Nun [illegible] das er diese variationem annuam praesertim circa perigaeum und apogaeum Lunae [illegible] ziehe, idque propter eclipses duas vel tres, praecipue propter eclipsem [illegible] die Januarii observatam, cujus initium [illegible] calculum [illegible].

Da ist mir eingefallen, ob vielleicht die aequatio [illegible] Schreiben nach die Theoria Martis [illegible] gäbe, [illegible] gedachte variationem annuam aufheben oder verändern möchte.

Bleibe dem Herrn angenemen [illegible] zu erweisen [illegible]

München in Eil, atque adeo in ipso [illegible] mihi videor. 23. Juli 1600.

In Opticis (Vol. II, p. 76) [illegible]

[illegible]

[illegible] Theoriae Martis insudavi, nec poe-[illegible] computare locum Martis, quantum omnes [illegible] tam praecise, quam Tycho locum Solis com-[illegible] nostra tempora). Praeterea agnovi verum [illegible] et jucundissime contemplor. Denique [illegible] in specula sum contemplatus, quid et [illegible] planetis; ex Marte vero exemplum cepi trac-[illegible] praesentibus itaque temporibus per omnes astro-[illegible] spero, quae vero de prae[illegible] et futuris [illegible] puto te scire. At non [illegible] omnis cura [illegible] praecisionem assequi nequimus. Incertitudo obser-[illegible] ut plane nihil illis tribui possit, quin [illegible] apparitiones praedixerunt leviori quodam [illegible], nihil est quod nos teneat sollicitos, in [illegible] commentores, quanto exquisitius ad tempora prae-[illegible]. Distinguit M. T. inter luminaria et planetas, [illegible] ut a planetis ceteris animum meum ad Solis [illegible] Video ex parte consilii hujus rationem. Sol [illegible] ceteri quinque astrologiae, quam damnas. [illegible] illam (damno autem tantum in ea, quantum [illegible] sunt consideratione. Et non omnino nihil [illegible] faciunt planetae ceteri. Ego enim ex [illegible] ex theoria Martis didici, simul didici [illegible] non tropicus tantum, sed ipse sidereus neces-[illegible] alio longior, aucta eccentricitate Solis, [illegible] itaque, si constaret aliunde, auctiorem [illegible] necessitate summa inferrem, longiorem fuisse [illegible] non accidentaliter h. e. vere Sol [illegible] et non tantum ad punctum ab

[illegible] Solis et Lunae, [illegible] Vol. II. p. 77. Ex [illegible]

hofft gehabt. Will demnach den Herrn Ihme selbsten zu verhofftem [illegible] vermahnt haben, dass Er diess Werkh unausgesetzt an Tage [illegible]

Keplerus (mense Maj. 1605) de [illegible] haec [illegible] Herwarto: [illegible] mei fuerunt Tabulae Lunares.*) Ante 6 septimanas [illegible] deduxeram et spem conceperam, transmitti posse [illegible] suspicio erroris de novo in laborem conjecit et descriptor [illegible] differendae fuerunt et postponendae domesticis negotiis. Suasit [illegible] ut totis viribus in theoriam Martis incumberem, et jam [illegible] [illegible] suscepto stimulo, manum in tabulis admoveram, [illegible] ad doctrinam [illegible] ipsum facere videretur, in qua versor. Itaque [illegible] ut pergerem, quamvis praeter opinionem hoc tantum fecit [illegible] enim fit, ut labores in primo aditu contemnamus.

[illegible] Herwartum [illegible] Keplerus [illegible] [illegible] Herwarto, [illegible] leguntur [illegible] p. 83 [illegible]. Deinde d. 13 Jan. 1606, [illegible] [illegible]: Theoria Martis exspectat aliquem, qui sumtus in opus conferat [illegible] torum in spem me erexit, nuncupata Caesari summa 300, [illegible] Quae spes [illegible] mihi non damnosa et temporis jactura [illegible] pecunia in promtu sit, prius mihi Tengnagli consensus [illegible] obstrictus sum. Ad Hipparchum igitur [illegible] puto jam prope peractam rem. In Jove parva [illegible] (mihi eccentricitas) moderatam habet eccentricitatem. In [illegible] [illegible] [illegible] in Mercurio [illegible] [illegible] in Luna, [illegible]

[illegible]

[illegible] Superius [illegible] Pars pecuniae, quam [illegible] D. Welseri [illegible] est in [illegible] typographum, magis idoneum [illegible] commendatus [illegible] intelligentibus. Figurae [illegible] sunt Pragae et [illegible] exemplar mense Septembri [illegible] ad deliberandum. Pars vero reliqua pecuniae cum [illegible] cum non fiant justae solutiones [illegible] [illegible] respicit instar [illegible], [illegible] Equidem si D. Welserus [illegible] rursum [illegible] solutionem (tantum [illegible] amplius [illegible] mihi securitatis accederet, quantum temporis [illegible] vel in Porphyrium [illegible], vel in geogra- [illegible] quaestorum mensas sectatum, [illegible] [illegible] exorquerem. Nam [illegible] deterit, mihi vero tempus consumit. [illegible] 24. Nov. [illegible]

[illegible] 1603 [illegible]

[illegible]

motione rationem vel saltem imaginari mihi non possim, [illegible] ut hic inter spem atque metum haereamus, quando scribis [illegible] tibi interdixisse: quid ita? an ut ille tecum solus fructus [illegible] nobis ceteris cum invideat? Absit! Consolabor ego me [illegible] [illegible], sed paulo post [illegible] vel prorsus [illegible] [illegible] ubi tibi sim impedimento, [illegible] potius [illegible] te adjuvare, [illegible] [illegible] possem, promovere. Vale [illegible] et feliciter. [illegible] 30. [illegible]

Keplerus his respondit (30. Nov.): Cl. Vir, Non sic [illegible] dicti Caesaris de distractione exemplarium Martis meique [illegible] quam imprimerentur illa legeres, quasi iis impressis legere [illegible] ut post t[illegible] recognitionem emendatiora prodeant. Nihil [illegible] multa mo[illegible] qua es ingenii dexteritate, ad quae respondebo [illegible] textum sum facturus. Misi typos ligneos Francofurtum. A[illegible] exemplar Septembri Lipsiam. De circulorum ejectione ex c[illegible] dices, ubi rem perceperis. Ex calculo non ejicio sed e coelo [illegible] solidos nego, nego etiam esse planetis mentes [illegible] contra affirmo, vehi planetas virtutibus magneticis. [illegible] naturam participans de circulos et ego sinabus [illegible] [illegible]

[illegible]

[illegible] veritatem [illegible]
[illegible] Tengnaglius [illegible] scripsit, [illegible]
[illegible] circa [illegible] recentis Tycho-
[illegible] Tengnaglius [illegible] nec
[illegible] Tu vero [illegible]
[illegible] Aliud est [illegible] aliud
[illegible] in maxima incredibilitate et [illegible]
[illegible] me revocas. [illegible] nec puto,
[illegible] magistri [illegible] quas [illegible] erat
[illegible] admonitionem. Ut [illegible] post-
[illegible] postulabat. Attamen ita [illegible] invicem
[illegible] multum valet similitudo argumentationis ab
[illegible] omnino mereatur haec curiositas. Quin
[illegible] parte a te sum meritus, et tunc literas
[illegible] et Beneficae et ex Styria per literas.
[illegible] fuerit admonitio an supervacanea; illi
[illegible] quae tu me admonuisti, ubi tu
[illegible] grato animo agnovi; potest id porro quo-
[illegible] Nec diversum de me sentias, quod
[illegible] non enim tibi de contradictione suc-
[illegible] scripseris ad me non instituendum
[illegible]
[illegible] est [illegible]
[illegible]
[illegible]
[illegible]

[illegible] in Sole et Marte [illegible]
[illegible] Lunae [illegible]
[illegible] hypothesis, sed [illegible]
[illegible] Mysterium Cosmographicum. Atque hoc [illegible]
[illegible]
[illegible] Tychoniani astronomi physicam [illegible]
injuriam destituitis in maxima incredibilitate et perplexitate [illegible]
[illegible] Cur non ego [illegible]
[illegible]
[illegible] partem [illegible] temporis, quod [illegible]
residuum [illegible] physicis contemplationibus motuum Martis [illegible]
[illegible] ut neutra [illegible]
[illegible] magnopere adversari [illegible]
[illegible]

Quod vero, [illegible]

[illegible]

se ipso libratur in diametro epicycli, rapitur a virtute [illegible] sparsa; utraque motio est inaequalis; libratio [illegible] lege duorum circulorum, ut in Copernico, [illegible] et remittuntur ad mensuram crescentis et decrescentis [illegible] quanto major apparentia disci Solaris in perihelio quam [illegible] major illic diurnus quam hic, vel eversa proportione, [illegible] phaseis in uno gradu anomaliae consequitae in aphelio; [illegible] Raptus vero mensura est copia luminis ex Sole in plan[illegible] distantia [illegible] nempe quantitas disci corporis Solaris [illegible] [illegible] impingens hanc solam viam [illegible] capitibus [illegible] 54 descriptum. [illegible]

Hoc simpliciter certum, ex Sole propagari vim [illegible] rapit; cetera sic quidem dubia, ut tamen identidem [illegible] ad scopum me propius adducunt. Habes de meo [illegible] Commentariis haec fortasse nemo nisi apud me viderit. [illegible] profitam. Quid vero tu jam agis, postquam [illegible] [illegible]? Nempe catalogum recenses eorum, quae [illegible] [illegible], et postea subjungis, me haec omnia [illegible] [illegible]. Bona verba. Quin tu potius exspectas [illegible] [illegible] literis [illegible] an tale quippiam [illegible] [illegible] [illegible] Ne quid [illegible] per [illegible] [illegible] [illegible] [illegible] [illegible]

[illegible]

[illegible] huius anni 1604. laboro ter maximo [illegible] operam dare [illegible] cum [illegible] hoc agerem, non tot jam modos aequationum [illegible] Tu itaque differ judicium [illegible] videas.

[illegible] primum rescribe, ut, qua animo [illegible] lectis [illegible] adscripto tempore, quo datae sunt) literarum [illegible] in praefatione ad „Tabulas [illegible]" [illegible] Hispanus, vi [illegible] [illegible] Angle [illegible] Martis edi non possunt, nisi ego [illegible]. Quae tu ex iis expectas, correctissima [illegible] ego, quae prae aliis, quae hic attentari ut [illegible]. Duae sunt, ut nostis, planetarum inaequalitates, [illegible] altera cuique propria. Illam ego sic [illegible] quatuor residuis satisfacturam. Hanc [illegible] tractavi, ut denique sese naturae legibus [illegible] utinet, [illegible] astronomia sine hypothesibus [illegible] gratulor vestrae genti de invento [illegible] magnetica.*) Nam ea plane mihi et [illegible] quid est, quod planetae circa Solem [illegible] Copernicum in eo), quid enim nisi effluvium [illegible] quod planetas facit a Sole excentricos, [illegible] ab eo recedere? Neque effluvium ex [illegible] et directio [illegible] in Marte sic sunt comparata, ut [illegible] qualitatem communia [illegible] in Opticis [illegible] videas.

[illegible]

[illegible] 95. libellum [illegible], cui titulus est Myste[illegible] [illegible] exemplar. [illegible] [illegible] [illegible] literas Phoenicem nostrum, Tychonem Brahe[illegible] [illegible] ille super eo libello judicium proferet, [illegible] tissimum, adeo ut me ad sese suaque studia [illegible] tempore in Cimbria, paulo post [illegible] in Bohemiam [illegible] probavi, admiratus sum, concupivi, haesi denique: et jussu [illegible] Tychoni credo promoturi familiam eo transtuli. [illegible] me potissimum, quod quam jam diu meditor HARMONICE[illegible] [illegible] nisi restaurata per Tychonem astronomia [illegible] [illegible] non possum. Quid? hoc mali dicam [illegible] justitiae fideique norma est et origo, quod [illegible] quibus decepti retinentur viri summi, quo minus [illegible] in commune conferant, in publicum edant [illegible] [illegible] Tycho plerasque planetarum theorias [illegible] proportiones orbium ad examinanda mea harmonica [illegible] [illegible] canones, quosque in Lunam, et quid [illegible] [illegible] jam olim perfecit, ne profert [illegible] [illegible] quidem lectissimas porrigit, nec tamen [illegible] [illegible] [illegible]

[illegible] de gemino stellae [illegible] causis [illegible] juvare potest. Similis hic est [illegible] procul dubio [illegible] Regiomontanus ejusque his imitator in talia hypothesi Copernicana [illegible] planorum in planetis [illegible] quae sit [illegible] instabiles reddunt. Id mihi semper alienum [illegible] quidem [illegible] in meo libello non feci mentionem, at [illegible] inclinationem plani constantissimam, quoties in eundem [illegible] recurrit, quorumcunque Terra recesserit. Idem in Venere [illegible] nodos eorum explorata habeo. [illegible]

Haec si Magine [illegible] fueris, unico [illegible] motum equidem [illegible] theoriarum, quod [illegible] attinet, formam esse plane eandem [illegible] simplicissimam [illegible] una revolutione constantissimam [illegible] circulum [illegible] supra [illegible] infra [illegible] prope Solem, idque non per [illegible] Nam Tycho etiam in Luna [illegible] adhibuit. Ex qua [illegible] plicitate [illegible] perfectione motuum coelestium [illegible] alienum, facile perspicies. Nam etsi Tycho Copernicum [illegible] retenta Terra in medio immobili, [illegible] potest, quin [illegible] quae planetae in [illegible] gyrantur, in spiras inaequaliter [illegible] Ac [illegible] facilior [illegible] capiti [illegible] computandi laboriosior [illegible]

[illegible]

[illegible] singulis binas aliae observationes adjun[illegible] planeta post integram revolutionem (quae inter [illegible] eodem loco sui eccentrici, linea [illegible] comparatis observationibus planetae, datisque [illegible] quae sciri dixi (1) in qualibet observationum [illegible] longitudinis, in quam cadit linea [illegible] centro [illegible] educta. Nam in vera oppositione cum [illegible] binis vero sociis beneficio periodi cognitae [illegible] reversum, ubi fuit in [illegible]. Cum [illegible] locus planetae sub fixis [illegible] faciant ullam unquam omnimodam [illegible] eodem in loco sui eccentrici versante, [illegible] Itaque cum detur locus Solis seu [illegible] dantur etiam anguli commutationis veri [illegible] aequationis simplicis per utrinque et planetae [illegible], si jam haberemus tabulas [illegible] unius trianguli (Sol, Terra, Planeta) [illegible] Terra inter verum Solis et [illegible] fit longitudinis parallaxis seu commutatio, [illegible] problema, quo sciatur locus apogaei Terrae, [illegible] ad utramque distantiam Solis et Terrae, [illegible] puncto distantia et utrinque [illegible] orbis Terreni seu magni in [illegible] planetae a Sole distantiam [illegible] etiam distantia [illegible] puncti (quod [illegible] Solis. Hoc uti fit in [illegible] Sed in altera planeta est [illegible] habetque inaequales [illegible] 100000,

[illegible]

[illegible] tres latitudines planetae [illegible] opposition cum Sole; [illegible] intejecti. Deinde opus est [illegible] simplici observatione [illegible] planeta [illegible] parallaxis (nisi ea, quam habet [illegible] fuit apparere, quam in ecliptica. [illegible] planetam [illegible] ex medioeri et [illegible] aequationum [illegible] medioeriter etiam praesciri potest. Tertio opus [illegible] inclinationis [illegible] planetarum, quam sic investigamus [illegible] aequaliter a Terra et a Sole, eadem est inclinatio [illegible] At circa exortus vespertinos et occultationes matutinas, [illegible] circulari Solis et planetae, [illegible] aequales [illegible] Tunc ergo planetae latitudo observetur et constituatur [illegible] cognitione theoriae planetae, quo loco [illegible] factaque comparatione [illegible] latitudinis [illegible] distantiam a nodo, in triangulo sphaerico [illegible] Tunc ergo scitur inclinatio planetae [illegible] [illegible]

[illegible] Fig. 3



[illegible] ut angeli circa A Solem [illegible] tur vero AC linea [illegible] 100000. [illegible] BC [illegible] AD, AE, AF, AG [illegible] quod BD, BE, BF, BG [illegible] inclinationem AC ad CD; [illegible] pone iterum ejusdem AC inclinationem ad [illegible] ita illic ponitur longitudo media, hic [illegible] triangulis ADC, AEC, AFC, AGC angulis [illegible] AE, AF, AG, [illegible] GAD, DAE, [illegible] angulis ADG, ADE, AED, AEF, AFE, AFG, [illegible] FA, AD et comprehensum FAD [illegible]

[illegible]

intermedio, recte habet et longitudo media, cum [illegible]
portio linearum ad AC, quam acceperimus esse 100000, [illegible]
numeros transponemus, ut BF sit 100000. Quodsi ergo [illegible]
in parte scrupuli recte haberent, essemus vel sic certi de [illegible]
BA, nec opus esset tanto apparatu, quantum supra [illegible]
intra 3 scrupula certi non sumus de observatione, [illegible]
ductione opus est a die proximo, quando serenitas observationi [illegible]
ad diem verae cum Sole oppositionis, ideo in incerto relinquitur [illegible]
dictum) in Marte quidem a 9200 in 12000 et ulterius, [illegible]
in parallaxibus orbis annui intolerabilis est. Aequationes [illegible]
prope verum addiscimus. [illegible]

Hactenus exposui, quibus in rebus a te, Magine, [illegible]
possint inventiones hae circa theorias planetarum Copernicanas. [illegible]
caput de difficultate calculi aggrediar, consilium tuum [illegible]
censeas constituendas tabulas, quam formam calculi [illegible]
nicus uti potuit anomalia commutationis, quia centrum [illegible]
anomalia, putavit esse centrum viae Terrae. [illegible]
[illegible]
[illegible]
[illegible]
trum Solis. Nulla hic aequipollentia hypothesium [illegible]
[illegible]

[illegible] ... rectanguli [illegible]
[illegible] ... 0° 0′ ad 10° 0′ per
[illegible] ... ecliptice
[illegible] ... ejus loci, quem obtinet planeta
[illegible] ... comparabitur cum loco opposito Solis
[illegible] ... anomaliae commutationis, qui [illegible]
[illegible] ... nobis
[illegible] ... maxime circa oppositionem cum Sole
[illegible] ... in eccentrico [illegible] in illo [illegible]
[illegible]
[illegible] ... quin [illegible] et planetae
[illegible] ... et angulum anomaliae [illegible]
[illegible] ... per [illegible] multiplicationes [illegible]
[illegible] ... compositae seu confusae.
[illegible] ... servatum angulum in area [illegible]
[illegible] ... planetae in ecliptica a Solis loco
[illegible]
[illegible] ... Cum [illegible] aequaliter
[illegible] ... et [illegible] compositio [illegible] hujus
[illegible] ... relinquo; nam ita quidem per-
[illegible] ... fore ut haec Copernicana hypo-
[illegible] ... facilitatem juxta mansura sit, quam quidem in
[illegible] ... desistam: tu vero jam pridem obtulisti
[illegible] ... condendis tabulis. Ac sane si ex restitutione
[illegible] ... non
[illegible]

pendet, cogitari igitur, quomodo parallaxis sine cognitione [illegible] investigari posset. Modi duo inciderunt. [illegible] semel alta semel humilior extra [illegible] quando est circa limites, ubi intra duas horas [illegible] Expedit autem id etiam in principio Cancri fieri, ubi [illegible] declinatio. Verum quando Luna eadem die post [illegible] fit sensibiliter humilior, acquirit parallaxin in longitudinem, [illegible] cum ea inquiratur. Alter modus est distinctis temporibus [illegible] cum est in gradu nonagesimo, in limite eodem, in eadem [illegible] semel altior semel humilior. At hae tres conditiones [illegible] quod singulis scrupulis in hac altitudinis observatione [illegible] unius [illegible] Terrae, quarum in eccentricitate [illegible] confiditur, [illegible] tertio [illegible] ut [illegible] potes in nonagesimo gradu et observationes una cum [illegible] poli altitudine nobis [illegible] in Germania communica [illegible] observationes [illegible] habeo. Ita fiet, ut Luna [illegible] in loco observetur sicque ejus in variis anomaliis [illegible] Nam Bohemia et Italia [illegible] in eodem meridiano [illegible] Vale [illegible] [illegible] Gratii Styriae [illegible] 1601 [illegible] [illegible] Tuus [illegible] [illegible] Keplerus [illegible]

[illegible]

[illegible] Sed quia jam [illegible] pagina [illegible], [illegible] Mihi tamen [illegible] Electione igitur [illegible] tibi videantur. Hoc unum [illegible] brevi lucem videbit. [illegible] si quis [illegible] Sed medium [illegible] ita conspicuae. Coepisse [illegible] Ante et post [illegible] In ceteris Lunae observatio[illegible] proponere [illegible] limbum, superiorem vel inferiorem limbum; [illegible] semidiametrum. At eodem momento per [illegible] diversas collectas 21, 22, 23, 24, 25, [illegible] pro substitutione [illegible] Itaque in observationibus Lunae [illegible] Et tamen ita pertinax est Tycho, [illegible] errorum confiteare velit.

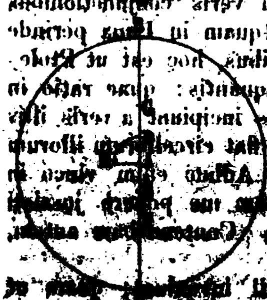
[illegible] hypothesis, primo in veris conjunctionibus [illegible] aequatione (quam in Luna perinde [illegible] Copernicus in 3 superioribus, hoc est ut Ptole[illegible] aequantis: quae ratio in [illegible] incipiunt a veris illis [illegible] ut inaequalis fiat circellorum illorum [illegible] aequaliter. Adhuc enim visco in [illegible] medum me ponere jussisti [illegible] (I. [illegible]). Contendebam autem, [illegible]

[illegible] nil inveniunt, quam ut [illegible] satisfatur sola illa, quam Asc. [illegible] aequali [illegible]

[illegible]dum, qui nescio an ad Angelum jussu facturus sit, certe in [illegible] loco[illegible] ♉, ☍, □, □, [illegible] facit. Is talis est: Luna, [illegible] ex planetis, naturae consilio movetur in longum, latum [illegible] sunt plures dimensiones. Motum in longum infert Sol planetis, [illegible] suo nihil addunt, nisi quatenus in diversis circuitionibus [illegible] Motum in latum planeta ipse conficit, Sol hic nihil confert. [illegible] profundum inter se partiuntur, planeta ascensu vel descensu, Sol [illegible] rando vel tardando ultra ascensus vel descensus mensuram. [illegible] eccentrici ponitur a planeta, centrum aequantis a Sole. [illegible] planeta quatuor medius longitudinis, inclinatio latitudinis, centrum [illegible] centrum aequantis. Luna prae ceteris hoc habet, ut [illegible] quaeque in [illegible] sunt simplicia, sint in hac duplicia. Duplicem [illegible] fontem [illegible] virtutis, Solem per se, Terram per accidens [illegible] supra, ejus fons virtutis est linea. Respicit igitur [illegible] quam circumit, sed etiam Solem. Omnia itaque sub quatuor [illegible] Primum, motus medius in linea diametrali velox est, [illegible] ☽ distat a diametrali linea. Hanc variationem per aequantem [illegible] salvavit, quia a Sole seu a fonte virtutis simpliciter [illegible]

[illegible] confert. [illegible] Terra [illegible] concentricum ☽ [illegible]

Fig. 9.



diametralis. [illegible] ☽ [illegible] aequantis in [illegible] centro [illegible] ☽ [illegible]

[illegible]

[illegible] apogaeo competit in lineam diametralem. At cum [illegible] circularis penitus est via Lunae? [illegible] variatur. Cum enim aequans sit nil [illegible] mensura physicae inaequalitatis in motu, quae inde [illegible] virtutis motricis veniens celeriter incitatur, [illegible] convenit itaque, ut Luna simul et centro eccentrici in [illegible] acceleratio et tardatio vel nulla sit [illegible] aequantis vel coincidat cum centro eccentrici [illegible] diametralis est fons virtutis [illegible] ☽ a ☌, centro eccentrici manente in linea, [illegible] celeritati, cum celerrima fuerit ☽ in linea [illegible] aequans, facietque maximam [illegible] apogaei et diametralis, sitque ☽ [illegible] nec tamen [illegible] aequantis punctum, tanto vero velociorem [illegible] perigaeo. Et tamen prima inaequalitas intercur- [illegible] in ☌, ☍ adhuc velocior sit, quam perigaea in □. [illegible] cum ☽ in ☍, ☌ incidit, quia a fonte vir- [illegible] est contemperationem fieri et punctum [illegible] Sit F Terra, E centrum eccentrici, [illegible] aequationi ☍, ☌, D pro maxima aequatione □. Ergo [illegible] ☌ fit libratio in DE; ille in □ versatur, [illegible] aequantis distantia augetur, ut sit in ☍, ☌ [illegible] aequatio est pro motu centri eccentrici a ☌. [illegible] libratio centri circelli libratorii ex A in D, ut [illegible] ab H in D numeretur ejusque [illegible] libratio sic instituatur, ut quantum ☽ [illegible] puncto eccentrici, quantum potest [illegible] ☽ in □, sit hoc punctum remotissi- [illegible] quam jam modo physicis rationibus [illegible] indiget alterius lineae. Maxima qua- [illegible]

Vale, et ero te rescribe, ut recreationem [illegible]

8. Feb. 1601. Pragae.

H. T. Gratiae Discipulus [illegible]

Proprius Martis theoriam, attingunt hae Kepleri literae [illegible]

S. P. D.

Clarissime vir, Praeceptor honorande. Quod tantum [illegible] me omnino credere jubet, te causam tacendi confuxisse [illegible] literis mihi exprobrasti (v. Vol. II. p. 15). Ego certis [illegible] transeuntibus non desistam, quoad vocem tibi expressero [illegible] non alio tempore magis tua opera et institutione [illegible] [illegible] Caesar curam instrumentorum [illegible] studiorum [illegible] impendere decrevit, salarium mihi [illegible] aliquam summam. Usus ego consiliis aliorum, quod [illegible] attinet, summam arbitrio Caesaris commisi, quod [illegible] Tychonis, quorum potissimo [illegible] Tabularum [illegible] fecit, dimidiam Tychonis summam sc. 1500 florenos [illegible] si Caesar totos 3000 Tychonicos det, me bene [illegible] [illegible] tempus patefaciet. [illegible]

[illegible]

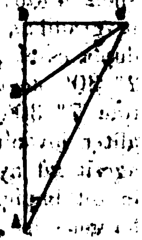
[illegible] et centrum orbis [illegible], in linea alia. Deinde [illegible] sit circulus circa putatitium centrum orbis [illegible] id centrum aequantis [illegible] punctum [illegible]. Tertio de libratione planetarum et [illegible] ita simplicissima fit theoria Martis; con- [illegible] singulas. Theoria Solis vel Terrae ipsi [illegible] et ipse aequante. In utroque demonstratio [illegible] ut diminuetur eccentricitas composita, quod [illegible] ita procedat, ac si incerta [illegible] proportio par- [illegible] illam circellorum proportionem statuerat. [illegible] aequationibus Solis a Tychone [illegible] nuspiam [illegible] infert, in aequationibus [illegible] circa [illegible] tota restitutio Solis Tyc[illegible], tantum [illegible] Solis assumuntur, et per consequens diametri [illegible] diametri variatio fit minor, quod in eclipsi [illegible] vel damno vel lucro. His consideratis in duobus [illegible] invenitque causam aequantis esse mere phy- [illegible] geometricis. Nam ut distantia [illegible] planetae in puncto illius distantiae ad quidam [illegible] [illegible] sine ulla gratia vel [illegible] loquendi formis) ex meris observationibus, [illegible] spe devorari planetas ceteros, Venerem [illegible] Mercurium. Nam quod Venerem attinet, ille [illegible] manifestissime [illegible] per positionem [illegible] Ptolemaeus [illegible] eccentricitatem illam ponit [illegible] [illegible] [illegible] [illegible] Veneris vero [illegible] [illegible]

excerpam anomaliam coaequatam in gradibus integris [illegible] apogaei, cum distantia sideris a Sole paulo breviore [illegible] scilicet perpendiculari ex sidere, cum habet latitudinem, [illegible] quae quidem perpendicularis itidem excerpenda erit [illegible] ex suis tabulis. Hoc pacto locum sideris proprium [illegible] dimensiones habebimus, cui supervenientes parallaxes [illegible] tabulis universaliter excerpi posse spero; sed ita erunt [illegible] parabitur locus Solis seu Terrae cum loco sideris [illegible] commutationis angulo, circa quem duo latera sunt distantiae [illegible] a Sole. Per solutionem igitur trianguli hujus [illegible] placet, cu[illegible]m Jöstelius facillimam reddiderit [illegible] inventio[illegible]uli ad Terram habetur parallaxis longitudinis [illegible] tionem v[illegible]stantiae sideris a Terra, quod est latus tertium [illegible] inclinationis supra excerpta comparationem latitudinis [illegible] bitur. Cumque distantia Solis et Terrae non detur [illegible] dem (omnia [illegible] ad verum Solis locum necessario [illegible] valentibus testibus), quae erunt ergo multiplicationes [illegible] latere, una pro comparatione ejus cum [illegible] inclinationis [illegible] multiplicationes pro cujuslibet planetae loco. Nec [illegible] tabula sinuum calculus iste. Est alius modus ex [illegible] [illegible] plane tertio, ut eclipticam necesse Terrae orbitam [illegible] [illegible] tabulam primi mobilis Regiomontani (ad [illegible] ad 90° per singula [illegible] desideras [illegible] [illegible] sed [illegible]

[illegible]

[illegible] ubi A Sol, B Terra, C sidus, [illegible] inventus, AB, AC distantiae [illegible] acceptae; primum ego dicerem, [illegible] Postea anguli BAC sinum BC [illegible] acciperem aque ex BA immutatam [illegible]: si BD fit 100000 quid DC? [illegible] pro angulo prosthaphaereseos DBC, [illegible] Pro latitudine secantem hujus [illegible] si 100000 fit DB, secans his [illegible] Jamque cum BC habeatur [illegible] 100000, et sinus inclinationis C [illegible] excerpatur, qualium omnis C [illegible] distantia [illegible] dicerem, si BC fit 100000, quid sinus C? is in [illegible] At si secantes fugimus, operemur summa [illegible] BA, AC et tangentem dimidii residui anguli, [illegible]

Fig. 10.



[illegible] si scis te Praeceptor honerandis certiorem [illegible] ut sententia tua mihi praeluceres, quod [illegible] opere. De Luna jam olim scripsi et de [illegible] quaeque illis cohaerent. Si tamen post curam [illegible] curanda, velim in principiis ipsis esse instruc- [illegible] observationibus varios invenio corporibus congruentes. [illegible] multum tribuo ac observationibus per [illegible] quae crebrae sunt in Tychone, ubi Lunam [illegible] habere potuit, tempusque una [illegible]

[illegible]

duplex. Cum ☽ in ☍ ☌ habeat aequationem maximam [illegible] sinus 4336 esset eccentricitas. Et jam in ☍ ☌ ut distantiae [illegible] in gradibus aequalibus eccentri confecta, at in □ ut distantiae [illegible] dupla esset proportio temporum. Nam eccentricitatis aequatio [illegible] 2° 30′, aequantis in ☍ ☌ etiam 2° 30′. At in □ alia [illegible] tota 7° 30′. Consentiunt paralaxes, quas Christianus in □ [illegible] aliter invenire, quam 54—59 semid. Terrae exhibentes, [illegible] egerit ad hypothesin suam accomodans feceritque 52—61 in □ [illegible] in tot implexu causarum quam facile scrupulum unum ex una [illegible] feramus in aliam, cum singula singulas semidiametros faciant [illegible] ergo de ae[illegible] quadraturarum, an illa sit dimidianda [illegible] versante, [illegible]ntiae sic tempora, at in oppositione ut distantiae [illegible] tionis hujus [illegible] inesse motibus. Iterum maneret circulus [illegible] eccentricitate. Tertio quid si utraque aequatio dimidianda [illegible] vero crescat in □? Nam de octantibus res est certissima [illegible] retardationem, ut crescunt sinus digressionis Lunae a [illegible] Terram euntis. Quodsi metiaris, invenies hic quoque fere [illegible] suam, divisa tota periodo Lunae seu tempore ejus in 360. [illegible] curreret in virtute diametri, tempora 350 conficeret. [illegible] crescunt in octantes. (In quadrantes 2° 30′, sed nihil [illegible] [illegible] Considera quaeso quidnam [illegible] an aliud quippiam sit magis consentaneum.

De obliquitate eclipticae res est mira. [illegible] 23° 31′ 30′′. Idem invenit ante annos 100 ex Regiomontani [illegible] Waltheri [illegible] observationibus. Idem [illegible] [illegible] hic Pragae observavit [illegible]

[illegible]

[illegible] quid [illegible] vetor, [illegible] D. [illegible] acceptas optime, silentio meum scribendi [illegible]: accidit mihi tamen, quod in bello [illegible] magis [illegible], quanto minus [illegible] et in [illegible] desperare. [illegible] si [illegible] Opti[illegible] cum aliis quatuor per bibliopolam Gellium apud [illegible] doctori [illegible] Franc[illegible], [illegible] de nova stella, quam jam accepis[illegible] [illegible] ob [illegible] C[illegible] Mt[illegible], cui [illegible] Ipsi [illegible] conquisivi, aliquid scribas. [illegible] scriptum jam accepit S. [illegible] Mt[as] : com[illegible] est materia, quam non attinge[illegible] desertionis

[illegible] Martis, si meos labores cerneres, [illegible] quoque etiam de Opticis [illegible] [illegible] in corpore [illegible]. Cur ergo [illegible]? Saepe mihi non cogitanti [illegible] facile agnoscerem. Omnis meus labor [illegible] tam aequaliter [illegible] per Dei gratiam [illegible] in alterο certusque sim [illegible] de Marte [illegible]

[illegible]

opus, quod edere vetor, apud [illegible] deponere. [illegible]
Refertum est creberrimis et [illegible] Tychonis [illegible]
sima spes esset de Tengnaglio, quod aliquid sit [illegible]
putarem meo consilio Tychonicis observatis. [illegible]
metuo, ne quo pacto desertae pereant. Quaeso quid tibi [illegible]
liceat esset et ista cerneres, an etiam [illegible] mihi [illegible]
agito? De eclipsibus scripsi ante menses multos, [illegible]
Sed nolo te agere, tange unum horum quatuor verbis, quibus [illegible]
culpam silentii [illegible]. Vale meque ama. Pragae [illegible] Dec. [illegible]

Excell. Tuae [illegible]

Gratiae Discipulus [illegible]

Quae Maestlinus ad tres praemissas literas respondit [illegible] Vol. II. p. 15, 682, 754, [illegible]

[illegible]

[illegible] 45' et 1352, in aequatione eccentri cir- [illegible] intelligitur, [illegible] hypothesin [illegible] [illegible] veriores per aliam aliquam hypothesin, [illegible] 18564, eccentrici 11832. Sed nec haec vera [illegible]. Potes tamen ex hac aequatione eccentri, [illegible]. Longitudini mediae in his addo 4' plus quam [illegible] sequente completi anni 1592, est 7^s 5° 55' 16". [illegible]

[illegible] fuit, reducere duas falsas hypotheses in unam [illegible] formas, quarum aliquas forte in superioribus [illegible] posuit, nisi naturalibus causis investigatis, quae [illegible] est circulariter magneticum et convertitur in [illegible] virtutis suae, quae non est attractoria sed [illegible] corpora contra se ipsis apta sunt ad quiescendum, [illegible] collocantur. Itaque ut a Sole moveantur, conten- [illegible] remoti a Sole lentius incitentur, propinqui velo- [illegible] super centro aequalitatis moveri aequaliter. Cum [illegible] statuendus est magneticus vel quasi [illegible] non pertinaciter rem ipsam) et quidem linea [illegible] polos, alterum fugientem a Sole, alterum [illegible] tenditur in partes mundi easdem fere. [illegible] fugiente polo obvertitur Soli, jam sequente [illegible] libratorias, nec aliam hujus rei modum [illegible] et appropinquans facit hoc ad modulum [illegible] per centrum corporis efficit cum [illegible] [illegible] quod prius in geometrica hypothesi dixi, [illegible] circa [illegible] epicycli [illegible] [illegible] [illegible] in epicyclo, [illegible] [illegible] superior [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] centrum circa [illegible]

[illegible] hypothesin, [illegible]



[illegible]

quod in anomalia eccentri DBE debuit DB esse 100000, [illegible] culus fuisset, jam DA est 100000. Datur igitur DA, [illegible] ritur pars aequationis optica BDA, et sic habetur anomalia [illegible] respondens anomaliae eccentri 90, sc. DBE; restat inquirenda [illegible] malia media. Cum autem anomalia media metiatur tempus [illegible] quae planeta in arcu eccentri DE conficit, et sint morae [illegible] plano vero DAE insint omnes distantiae (quod peculiariter in [illegible] tariis demonstratur), inquirenda est igitur planities DAE. [illegible] Posito enim, eccentricum esse perfectum circulum, datur sector [illegible] planities DAB trianguli aequatorii. Datur vero ejus basis BA [illegible] nempe sinus anguli DBE, cum ergo aequealta sint ut bases et [illegible] ut altitudines, dabitur proportio cujuscunque plani DAB ad planum [illegible] cujus angulus DBA rectus est. Quare semel cognito valore [illegible] DBA (ubi sic dico: planum circuli ex Adriano Romano [illegible] valet 360° in prima et secunda resoluta; quid valet planum [illegible] cognoscentur et plana reliqua, quae ostendunt alteram partem [illegible] physicam, ut sic tota planities DAE sive anomalia media aut [illegible] Ptolemaica DCE angulus habeatur. Duo hic objicias, primo [illegible] esse perfectum, planum circuli non metietur vel comprehendet [illegible] ex [illegible] quod verum esse demonstro peculiariter. Deinde [illegible] falsum scilicet [illegible] esse circulum, quae verissime est ovalis [illegible] [illegible]

[illegible]

[illegible] et distantiarum a Sole, accommodatis ad [illegible] et antiis Saturno et Jovi, ut in ♄ Pr[illegible] [illegible] maximam 6° 20′ 30″, cujus dimidii [illegible] est eccentricitas. Sed quia hic ejus eccentricitas [illegible] Solis, sed a puncto, quod ♄ apogaeo est propius [illegible] radii orbis Terrae 100000; hoc est per 360 in [illegible] ♄ 100000 (quia is fere decuplus ad radium orbis [illegible]) ab eccentricitate Prutenica, et 5218 remanet. [illegible] aequationum mea methodo constructam ad has eccen[illegible] 4400.

[illegible] faciunt aequationem eccentrici maximam 5° 14′ 0″, [illegible] ejusque sinus 4563; parum hic mutabitur sive [illegible] apsidum puncto computetur, quia aphelium ♃ [illegible] tabulam aequationum eccentri ad singulos [illegible] et ad eccentricitates hasce: 4400, 4500, 4600, [illegible] ut postea verissimam proportionaliter investi[illegible] anomaliae. Ego nunquam adhuc probavi [illegible] aequationum majoris super minorem constanter [illegible] in proportione sinuum, alias negotium esset [illegible] hoc sperandum, nam per eccentricitatem 1800 [illegible] methodo, quarum ad viginti tentavi. Aequa[illegible] 30″. At in eccentricitate 9300 aequationes [illegible] differunt. Non igitur ut Solaris aequatio [illegible] Solaris 45° ad Martiam ejusdem gradus. (Verum [illegible] physica. Nam ut sinus omnium graduum sunt [illegible] triangulorum DAB (Fig. 12) sive magnae sive [illegible] non item. Nam ibi prolongationes [illegible] in proportione eorundem sinuum DBE, ex [illegible] A in 90 sinus exeunt itidem proportionalis. Sed [illegible] lineas DA amittunt illam proportionem (quare [illegible] [illegible] distantiarum AD inversa. [illegible] [illegible] eccentricitate [illegible] minus et illa.) [illegible]

[illegible]

est circiter 4°, in ☿ plane ad 8°. Nam quod minor [illegible] est ob parallaxin. Omnino levissimum est redditum negotium [illegible] quod nudissima excerptione ex tabula parallactica mea [illegible]

Sed tandem vale. 5. Martii 1605.

Hon. Tuae gratiss. discipulus [illegible]

Maestlinus iterum obmutuit, certe nulla neque in Hanschio neque [illegible] ejus exstat responsio, et proximae, quae occurrunt Kepleri literae (d. [illegible]) testantur, ad hoc tempus non respondisse Maestlinum. Spem fecisti, [illegible] sime, praeceptor honorande, te frequentius hoc epistolarum [illegible] Id maxime optavi emissa epistola ecliptica (Epistola ad [illegible] amatores de Solis deliquio, quod anno 1605. mense Oct. contigit [illegible]) Cumque his meis sumtibus adsit tabellarius, is non sine literis [illegible] jussus est. Rogo itaque jam facias, quod in publica epistola [illegible] nunciam differas.

Reliqua quae insunt his literis ad familiam Keplerı pertinent [illegible] sententiam suam dicat de Tubingensi quodam, qui „ambire dicitur [illegible]" alio loco inserenda. Maestlino obstinatum silente, paulo post Keplerus [illegible]

S. P. D.

Literas te meas accepisse, Praeceptor honorande, [illegible] derunt enim ceteri, qui literas una tecum acceperunt. [illegible] scio hanc [illegible], quod ingratam et periculosam [illegible] [illegible]

[illegible]

[illegible] 364) quamquam astrologiae summo studio addictus et [illegible] Keplero plurimas [illegible] innumeris dubiis et [illegible] in observandis sideribus et [illegible] studio, non tantum [illegible] vertendi. Quare et vir Keplerus, magni habens [illegible], quae ipsum [illegible] ea, quae Fabricius de coelo [illegible], [illegible] ab eo [illegible] nova in coelo observaret. Cui desiderio Fabricius [illegible], quod [illegible] literae haud parvi numeri et ex parte [illegible] Vol. X. Manuscriptorum Petropolitanorum. [14]) — Quarum [illegible] de Martis ejusque motibus et theoria, et quae illis respon[illegible] inter annos 1602. et 1609, perspicue exhibent rationem [illegible] Martis" et lucem afferunt ad historiam inventionum Kepleri [illegible]. Nam ipse Keplerus in praefatione ad haec Com[illegible] ad Martis motus inquirendos [illegible] haec primo [illegible] (anno 1600), Tychonicis in Marte observandis [illegible], in eadem et ego incidissem"), idemque testantur [illegible], suspicio non esset absona, Keplerum a Fabricio [illegible] Martis theoriam emendandam suscepisse.

[illegible] 1602 (comp. Vol. II, p. 481) haec dedit Keplero: Vide [illegible] D. Tychonis, ut commendationi horum Uraniceorum [illegible] (Scholtum), ac denique spei nostrae de te [illegible] amicitiae et inceptum tuum pro virili continuum, [illegible] gloriam. Adjuvato, quaeso, [illegible] Nob. D. Francisci [illegible] et [illegible] annis Tychonianis in [illegible] peto, ut tuas cogitationes de Uraniceis [illegible] dedignaris.

[illegible] aggressus sum Martis motum, ut [illegible] [illegible] in diversis [illegible] una et eadem [illegible] ad [illegible] vel [illegible] motum Solis Mars [illegible], [illegible] Martis non sint in eodem circulo? [illegible]

primum incipio manum admovere aratro, utpote qui hactenus solis observationibus [illegible] Uraniis instrumentis operam dederim. Cupio nunc abs te [illegible] in quibusdam doceri. Tu mihi D. Tychonis loco in posterum quaeso [illegible] mihi in vasto hoc astronomiae [illegible] exercitiorum mari constituto et dubi[illegible] egregie vexato et a veri itineris [illegible] dejecto, praeluceas. Quantum [illegible] Professoris tuus ostendit, sed etiam D. D. Franciscus et Johannes [illegible] Quo usque in motuum correctione progressus sis et quam feliciter [illegible] tamen Mars tibi sit Mors; nimio enim studio saepe [illegible] ipsis [illegible] Ars — Mars — Mors. — Ars persequitur Martem, Mars vero Mortem [illegible] Ultimo quaero, an deprehenderis Martis motum magis [illegible] quam [illegible] cui? Extemporaneum stilum eumque rusticum et impolitum boni [illegible] sollicitus nunquam, amo res. — [illegible]

Eodem quo haec scripsit Fabricius die aliud addidit literas, [illegible] Quid, quaeso, de tanta literarum mole deque tot quaestionibus [illegible] Certe si de tua humanitate dubitarem, te [illegible] iri [illegible] [illegible] ut hanc meam [illegible] compellationem te male habiturum [illegible] [illegible] (docte) [illegible] opinionem [illegible] nunc tertio in mentem subito venerunt. [illegible]

Postquam perplexum [illegible] laboriosum illud [illegible] acronychiis [illegible] et [illegible] eccentricitatem [illegible] quae varietas, quae inaequalitas! Ex acronychiis [illegible] eccentricitas [illegible] in oppositis locis [illegible] eccentricitate. [illegible] acronychiis [illegible] quaestiones) [illegible]

1) Cum ex singulis acronychiis [illegible]

2) [illegible]

[illegible]

[illegible] eccentricitas, [illegible] videntur confirmari. Cognovi illud [illegible] principiis [illegible], sed etiam ipsa methodo inquisitionis [illegible] ab te adductis [illegible] videtur, quae non sat [illegible] acronychiis [illegible] regulam [illegible] semper [illegible] [illegible] non consentiat nec praebeat [illegible] distantias Martis [illegible]. Quare plurimum rogo ut in 4 acronychiis [illegible] [illegible] regulae [illegible] non intelligo. [illegible] ex quibus [illegible] discere possim. Quod [illegible] in [illegible] ad [illegible], vel ad aphelium non vero ad apogaeum, miror. [illegible] utrisque hypothesin quoad acronychia. At ego in hypo- [illegible] errorem, qui 6′ faciat, sed saltem 1′ vel [illegible] minutis. [illegible] Tychonis eaque utriusque eccentricitatis proportione [illegible] acronychiis observationibus omnibus respondet; [illegible] [illegible], non quidem propter erroneam reductionem, uti putas, [illegible] in principio ♋ major differentia incideret], sed potius [illegible] [illegible] eccentrici proportionem. [illegible]; [illegible] 20000, [illegible] est 10260.

[illegible] hypothesi omnia acronychia in ipso minuto fere conveniunt. Quare [illegible] esse videtur et quod alia reductione utaris quam visa. Etsi [illegible] angulum latitudinis visae in medias latitudines [illegible] non sit, tamen non [illegible] fallitur, [illegible] per se reductionem institutas. Nam, cum planeta non [illegible] circulo vertatur, quid prohibebit, illum non per veram sed [illegible] mihi hoc quisquam persuadebit, nisi aliis argu- [illegible] comprobata fuerint.

[illegible] Martis in eodem loco [illegible] dimidiam [illegible] probare non possum. Non enim tempore [illegible] Solis per Tychonem. Si ex Martis parallaxi differentiam [illegible], certe non ex proprio sed alieno agro haec [illegible] [illegible] et ex illis propriis observationibus [illegible], non [illegible] forte alias [illegible] habet. Ex Sole [illegible] ad restitutionem Martis, non a centro, ex [illegible] Tycho [illegible] observator per [illegible] circa 18° ♉ et ♊, si [illegible] [illegible] observavit, qui [illegible] [illegible] motum Solis [illegible]. Nam [illegible] quantitatem [illegible] Variatio [illegible] eccentricitatis maxime [illegible]

[illegible]

Solis majorem esse asseris, magnopere miror. Quae de parallaxibus [illegible] differentiam excusabunt, cum non sit multo major quam in Sole. [illegible]

Quaeritur, an centrum eccentrici Martis re vera fixum sit in [illegible] eo locum habeat? Tycho primum vult. Quomodo tu existimas, Martem [illegible] punctum motu medio respicere, si ad medium motum ille [illegible] imaginarium punctum et tamen illius motus ut verus ita medius [illegible] eccentrici planetarum non est in Sole, tunc latitudines mutabuntur [illegible] eclipticae ad illorum periodos fixas et uno loco [illegible].

Quaeritur, cur duplex in planetis eccentricus et quae causa, quod [illegible] [illegible] motus apsidum excusari non possit? &c. Vale, Vige et Flore [illegible]

Dabantur Resterhaviae in Or. Frisia d. 1. Aug. 1602.

(Inscriptio: Dem Erbaren und Hochgelarten Herrn M. J. Keplero, [illegible] Mathematico. Meinem vilgunstigen Herrn und Freunde. Zu Prag. [illegible] steinen Haus auf dem Rotzin zu erkunden oder gewiss in der alten Stadt [illegible] zum gulden Hünchen. Mit Fleiss zu bestellen.)

Responsio Kepleri, prima earum, quas exhibent manuscripta, [illegible] 1602. (Comp. Vol. I, p. 308.) Sic exorditur Keplerus:

S. P. D.

Quisquis ille sit, cui literas commendasti, doctissime Fabrici, [illegible] illas curavit. Audieram ex haeredibus Braheanis, jam [illegible] literarum ad me spectantium in suas aedes delatum, [illegible] quod nescirent, conclusas esse et aliquas ad se missas. [illegible] negasse tam longum iter literarum causa ingredi (nam in [illegible] novae urbis habito), fore ut qui literas quaerat ultro [illegible] sivi illas per 3 septimanas, ignarus unde essent. [illegible] [illegible] homo occurrit et utrum Kepleri mihi nomen sit [illegible] [illegible] Archiepiscopi ablegat, ubi latuere. — Exordium a [illegible] [illegible] tibi gratias ago. — Et cum plurima in literis [illegible] a me [illegible] [illegible], nescio quomodo [illegible] [illegible]

[illegible]

[illegible] 494, partibus [illegible] in [illegible] [illegible] enim de [illegible] [illegible] in Marte [illegible]. [illegible] ergo [illegible] De [illegible] [illegible] schematis explicatione [illegible] [illegible] arithmeticis disci possit, sed [illegible] [illegible] (supra p. 48), quia [illegible] operandum [illegible] [illegible] operabimur: si illic [illegible] hic [illegible] [illegible] semper [illegible] esse 10000 vel 20000 [illegible] circa centrum aequantis [illegible] circa centrum [illegible] ex differentiis temporum, quibus distant [illegible] [illegible] differentiis locorum in quibus Mars est visus. [illegible] in regula falsi [illegible] exemplo semper [illegible] 4 locis in uno esse circulo, [illegible] nostra exigit; et simul ut centrum [illegible] [illegible] Primo [illegible] longitudinem aliquam [illegible] [illegible] statim initio [illegible] 2 positiones, [illegible] [illegible] statim sequitur quantitas radiorum in [illegible] [illegible]. Et [illegible] habetur quadrilaterum; [illegible] [illegible] [illegible] ab [illegible] longitudine media. In toties [illegible] [illegible] [illegible] longa [illegible] extra [illegible] longitudinem [illegible] utcunque et ad quaecunque [illegible] ab initio hactenus sunt dicta [illegible] ergo, [illegible] [illegible] centrum [illegible] inter [illegible]

sequens multum facit. Quo in loco planetam videmus, ex eo [illegible]
recta ducitur, determinans locum ejus eclipticum; haec [illegible]
ad eclipticam. Jam quia planeta nec in suo loco ecliptico [illegible]
sed loco intermedio (visus enim locus parallaxi orbis annui [illegible]
implicatus etiamnum sub ipsam acronychiam visionem) [illegible]
illa ad eclipticam recta, quae secat orbitam planetae, locum [illegible]
in sua orbita. Angulus rectus ab ecliptica et arcu latitudinis [illegible]
arcu orbitae Martis a nodo ad hunc locum, est ergo iste [illegible]
a nodo ad punctum eclipticae. Certe nuspiam Mars nisi [illegible]
satur, minime in latitudine visibili, nec attinet ad proprias [illegible]
viam nobis videatur sub fixis describere. Nam sub fixis [illegible]
illis nec tortuosam viam describit nec egreditur, quae [illegible]
putamus. Videris tandem provocare ad observationes rejecta [illegible]
At iniquum est postulatum. Quid? Nihilne in astrognosia [illegible]
quod observationes monstrarunt? Quae ergo subtilitas [illegible]
aequationem temporum idque veteres? de Tychonica non [illegible]
quoque reductio unde primum orta? Ab observatione [illegible]
a ratione. Ego doceo rationem, veram esse non doceo. [illegible]
veteribus jure [illegible] observationes per reductionem [illegible]
veris [illegible] adhibeam. Qua ego [illegible] astronomiae [illegible]
gloriari [illegible] eccentricitate Solis dimidiata [illegible]
Non tamen [illegible] constitutis [illegible] Non [illegible]
Tychone [illegible] Nihil eorum tolle, quae ex [illegible]
[illegible] et Ch. Severini [illegible] vive Tychone [illegible]
[illegible] Tycho 2600 [illegible]
[illegible]
[illegible]
[illegible]
laxes? Eodem jure ego in casu plane eodem utor. Nam [illegible]
[illegible]

[illegible] quia uno reali loco non reperietur. Ego vero [illegible] hic sit certius? Hinc stat auctoritas, sed [illegible] ratio physica: Quid enim post Copernici inven[illegible] orbe ♁? Cur alter alteri leges prae[illegible] sola probabilitate et calculi ratione fretum ausum [illegible] supponere tanquam in regula falsi. Exacta vero [illegible] ab observationibus esse confirmatissimum. [illegible] aequationibus per 2° aberrat, ego non per 2′. [illegible] 15° ♉, 15° ♌ deprehendisset suis instrumentis. [illegible] dum hic fuisti non satis versatus. Nam [illegible] intra 36′ (?) instrumenta consenserant. Si uno usus [illegible] potuit, quia alterum id non confirmavit quod obser[illegible] in observationibus, quoties cum loco Solis [illegible] novum est 1—2½′ differentiae superesse; [illegible] quando hypotheses exstruxit; nam [illegible] in aequinoctiis fateor rem ad 16′ adduxit, [illegible] labor prohibuit, quo minus in aliis observa[illegible] faceret. Quoad praxin, ubi ex trinis et [illegible] exstruxit, semper aliqua in apogaeo et [illegible] quin imo posteriori tempore ½° apogaeo [illegible] in hoc negotio.

[illegible] motus. Falleris; nisi apogaeo variato [illegible]

[illegible] haec talis non est, quae maximam [illegible] in aequinoctiis, mutet. Manente ergo vero [illegible] aequinoctia, non mutatur annus. Erras [illegible] Nam quia 3600 subtendunt [illegible] subtendunt 1° 1½′. At non vides, me [illegible] cujus in efficienda aequatione [illegible] 3600 simplicem ego divisi in 1800 [illegible] divide [illegible]

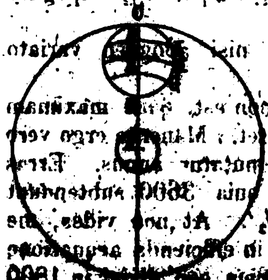
[illegible]

per verum. Dissident hi duo causa evagationis a …
aequanti Solis accedit. Ego partem hujus erroris per …
locum Solis, partem per aequantem Solis expedivi. …
nescires, frustra ad quadratutas et solstitialia puncta …
es, hinc jam bene colligo, contrarium evenit et observa…
convenit. —

Ego in methodo mea supra descripta 4 acronychiarum …
bisectionem eccentricitatis, illa operatione quaero hypo…
vicariam. Nam cuniculos ex observationibus in ipsam …
agere plane despero. Oportet omnino vicariam interpo…
vicaris verum attingere.

De aequipollentia hypothesium ita est, ut scripsisti …
aliqua addenda est, quae te fugere videtur. — Accipe …
Martis et Solis, et mecum speculare, quomodo quaelibet …
seorsim computanda sit, quam rationem ego nondum …
theses calleo. Puto autem semel tabulam aequationis …
postmodum attendum; possum autem ex vera tabula …
ubi semper posterior aequatio praesupponit priorem, aequatio…

Fig. 14.



A Sol, AD radius orbis …
eccentricitas. … Quod … Sol …
Mars … C per I, H, G …
cujus eccentricitas 9165, …
etiamnum describit illam ratio…
centri A, sed inaequaliter …
motus … in …
Nam … principio …

[illegible] Martis in C tardus est motus circa ☉, in H mp[illegible], [illegible] tamen aequalis manet motus circa B centrum. Hoc [illegible] Martis inest, figura ovalis. Nam citius [illegible] AH, quam circa ☉ in locum a B qua[illegible] ad latera seu in longitudinibus mediis fient [illegible] perfecti circuli eccentrici exigit, et differentia versus [illegible] versus apogaeum: quae justa definitio figurae [illegible] est motus ♂, eadem accelerationis puncti B [illegible]. Si vis scire, in quo gradu celeritatis sit ♂, [illegible] duplicem ejus a ☉ distantiam. At si vis locum [illegible] accumulatae omnes ab apogaeo distantiae in [illegible] inciderunt, in motu effecerint. At cum [illegible], quia infinita F, G, H, I, C puncta, et illae non [illegible] circa ☉, confertiores enim quae longiores, [illegible] quae breviores, hic vides difficultatem com[illegible] hypothesi vera et physica.

[illegible] divido circuitum in 360°, et fingo planetam [illegible] est. Ita ordine ab apogaeo omnium gra[illegible] anomaliam. Idem intellige per omnia [illegible]. Haec ergo omnis hypothesis ♂. Proportio [illegible] : 152548, circuli ♂ semidiameter 100, [illegible] in 14° 20′ ♉, [illegible]

[illegible] scribendum incidit et quomodo physicam [illegible] nobis praestant efficienda, concinnierem. [illegible] virtute ☉, quod est [illegible] remittere, intendere, pro ratione [illegible] aequalia spatia describendi, quod [illegible] Soli [illegible] planetae vero [illegible] non viribus sed sola nutu [illegible] a ☉ [illegible] per modum [illegible]

explicato tantum dimidiam potest; metues forsan, ut [illegible] possit. Scito ergo, ratione optima posse. [illegible]

Nam in prioribus imaginatus sum lineam circularem [illegible] in illam effluentis punctum mathematicum: in his dixi [illegible] graduum motricis virtutis ex ☉ egredientis. At virtus [illegible] gitur non ex solo centro ☉, sed ex toto corpore egredi[illegible] efficitur proportio virtutum ad proportionem distantiarum [illegible] planissime (quod prius tantum in parte usurpaveram) [illegible] virtutis ex ☉ egredientis; quaeritur, si quis dupla [illegible] quanta sit apparitura ☉ diameter? Fere dupla, prius [illegible] ∠ [illegible] (Fig. Cap. 36). At quia ☉ non est diameter, sed [illegible] dupla sit proportio figurarum ad proportionem diametrorum [illegible] Solis area visibilis quadrupla prioris. [illegible]

His est modulus increscentis ab appropinquatione [illegible] virtutis. Sol ergo duplam aequationem eius conficiet, [illegible] 9165 circello, et composita via ♂ circa ☉ plane ut [illegible] Exspecto, qui tibi placeat haec speculatio. Mihi ego in [illegible] et tibi gratias ago, quod me ad scribendum instigas [illegible] saepe antea, sed impedimento mihi fuit [illegible] [illegible] in longum moveri posse. Considera an [illegible] [illegible] physicam sine hypothesibus [illegible] ☉ certa est; ascensus et descensus planetarum [illegible] [illegible] majores et minores. [illegible]

[illegible]

[illegible] eccentricitas simplex permanent, ne in motu ejus [illegible] lunatio violenta committatur et alia ratione Martis motus [illegible]

[illegible] respondens Fabricius (d. 8/18. Nov. 1605, comp. I, p. 312), [illegible] concludit, dicit: Non est quod verearis, vel illa vel alia [illegible] In negotio reductionis ad eclipticam mihi plane satis- [illegible] quid non cogitasse. Verum est, Martem nec in vivo nec per [illegible] sed in alio motu. Ex falso igitur verum dari non potest. Quae [illegible] eccentricitatis Solaris adducis, meas objectiones potissima parte [illegible] ex variatione hypotheseos Solaris certe liberatum esse.

[illegible] cogitationibus motricem virtutem Martis spectantibus jam aperire [illegible] Nam heri tuae literae mihi traditae sunt.

[illegible] (Vol. II. p. 95) nondum accepta Kepleri epistola sequentia [illegible]:

[illegible] hypothesi, una vicaria altera vera inquirere laboras, [illegible] hanc non esse per omnia veram vel saltem mancam esse. [illegible] vera distantias inquiris. Si vicaria vera, tunc utrumque [illegible] per omnia esset vera, non indigeres vicaria. Laborandum [illegible] hypothesis excogitetur, quae quam proxime in omnibus [illegible] difficile adeo sane videtur, si imaginationem tuam de duplici [illegible] mihi, si recte judico unica et verissima causa [illegible] Martis aequationes necesse habeas. In Solis hypothesi [illegible] esse oportet, sive quoad veterum suppositionem, [illegible] ad salvandos motus Martis dimidia illa eccentricitas Solis, [illegible] potius vel sub Terra imaginari debet. Hinc [illegible] [illegible], quia propter considerationem distantiae eccen- [illegible] a Terra (quae sub centro eccentrici Solis est) [illegible]

[illegible] et imaginationem in Sole abjicere. Quando hanc [illegible] ut non judicium praecipitare, [illegible] [illegible] scribo, quia post plures [illegible]

[illegible]

aequipollentis aequatur? vel una et eadem prosthaphaeresis Martis [illegible] differentiae sit eadem? [illegible]

Quinto, causam miraculosae et vix credibilis apparentiae in [illegible] mense ante oppositionem acronychiam magnam expecto, nam [illegible] observationibus recedere omnino puto. [illegible]

Sexto, schema quoque et rationem calculi expeto, quomodo ex [illegible] ad idem eccentrici punctum factis semidiameter orbis annui [illegible] talium trium observationum mihi communica; nam ego non habeo [illegible] gratum, si mihi communicaveris.

In literis proxime sequentibus (d. d. 20. Jan. v. st. 1603), [illegible] haec scribit Fabricius: video tuam hypothesin bono fundamento [illegible] duplici uti hypothesi, cum ex una illud fieri oportebat. Quare [illegible] Ego gaudeo, Tychonem talem successorem consecutum esse, qui cum [illegible] restitutionem complere possit. Quaeso ut mittas nudam hypothesin [illegible] circulorum justa. Sic ego incipiam illam ad observationes [illegible] vide Vol. I, p. 323.)

Interim advenerunt Kepleri literae responsoriae ad priores [illegible] d. 2. Dec. 1602. (comp. Vol. I, p. 312 ss, Vol. II, p. 55, 478 [illegible]) sequuntur:

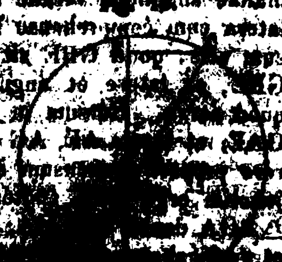
De anomali incremento Martis latitudinum bis terve [illegible] replicasti. Mones me, ne nimium speculationibus meis [illegible] verum fatear, ejus rei causam cum speculationibus [illegible] contuli, nisi quod scio, ubicunque latitudinem [illegible] hypothesin observatum [illegible] Tychonis observationibus, qui a. 1583 mense Jul. et Aug. [illegible] annotat, latitudinem 14 diebus ante ☍ [illegible]

Ego postea deprehendi, id mirum aut novum aut rarum [illegible]

[illegible]

[illegible] Quaeritur amplius, Martis motiones ad [illegible] [illegible] sint referendae, quod perinde est ac si quaererem, [illegible] Martis per medium locum Solis an per ipsum cor[illegible]. Hic Copernicus et Tycho imitatione Pto[illegible] Solis, ego a vero loco. Invento centro vel [illegible] superiorum, h. e. puncto in quo omnes lineae eccen[illegible]rum concurrunt, jam is, qui eccentricum sequitur, sane [illegible] hoc medium dicit; qui concentricum cum epicyclo, [illegible] hoc communi puncto, quod mihi centrum corporis [illegible] vide quomodo ego dixerim, Martem imaginarium [illegible] medium motum ☉ referatur, id est si anguli ano[illegible] stant ad punctum, quod est non ipse ☉, sed [illegible] ☉ motus, quod interdum praecedit Solem, [illegible] supra, nunc infra Solem est; tum illi anguli stant [illegible]. Ut intelligas, quid ego dicam imaginarium, [illegible] anomaliae coaequatae stant ad punctum medii [illegible] punctum, si non sit ipse Sol, non sit par ferendae [illegible] Martis in Tychonis hypothesibus; vel, ut etiam in [illegible] vereor ut Mars id punctum, si non sit ipse Sol, [illegible] enim punctum est quasi communis paxillus vel axis, [illegible] Saturni, Jovis et Martis circumportantur in [illegible] his verbis aliud quoddam innuere voluerim, sed [illegible] contendere; mitto ista, si te impediunt. Non [illegible] verba tua: „Sol non est imaginarium punctum, et [illegible] medius consideratur.“ (v. [illegible] p. 84.) Haec sunt verba [illegible] Fabrici: cum dico Solis motum medium, dico [illegible] pone, supra infra Solem est. Imagi[illegible] Solis moveri, ut centra ejus et mundi coeant, quem [illegible] illo imaginario sphaerae situ et motu esset [illegible] et motum medium Solis, non quod ipsum Sol [illegible]

[illegible] te, si centra planetarum orbium [illegible] eclipticae latitudines varientur. [illegible] et [illegible] eclipticae, in pro[illegible]. Forte [illegible]

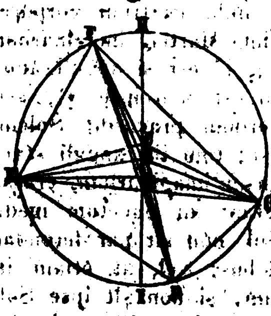


[illegible]

in arcubus viae suae aequalibus. Quare Sol longius [illegible] in apogaeo moratur quam in perigaeo; ad elongationem igitur [illegible] currit physica et optica causa tarditatis motus.

Haec sequuntur responsiones Kepleri ad quaestiones Fabricii [illegible] supra citatis inseruimus. In fine epistolae redit Keplerus ad Martem [illegible] Magino) rationem suam procedendi explicans, quam secutus est Cap. [illegible] ment. Martis:

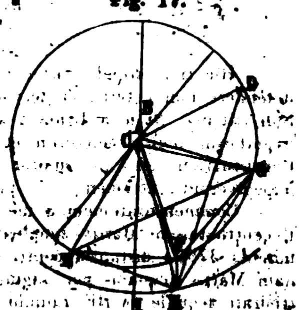
Fig. 16.



Jam ponam, quae duo [illegible] Sit A Sol, B centrum eccentrici [illegible] trum aequantis, AG, AF, AE, AD [illegible] Martis in quatuor oppositionibus [illegible] Ex quibus dantur anguli ad A. [illegible] C dantur ex mutua tractatione [illegible] liarum verarum simplicium, tem[illegible] dentium, etsi falsus sit hisce [illegible] maliae, modo vere constet, ut [illegible] restitutio integra quam proxime. [illegible] mum pone aliquam anomaliam [illegible] illa vera, quam dant [illegible] ergo anguli HCF, HCG, HCD, [illegible] pone aliquod apogaeum [illegible] ponatur id primo, quod dant omnes tabulae. In triangulis [illegible] D, E super communi AC stantibus dantur omnes anguli, [illegible] quacunque mensura, puta 100000, et computa latera AF, AE [illegible] proportione AC. Habes triangula DAE, DAG, GAF, [illegible] duo latera cum comprehenso; quaere ergo et angulos [illegible] ergo compositoria AFG, AFE, item AED, ADG, debent [illegible] et F in quadrilatero in circulo aequari 2 rectis. Si non [illegible] ad positio posterior apogaei, relicta positione priore [illegible] faciendum toties, donec [illegible]

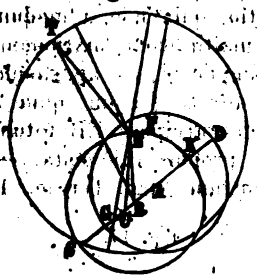
[illegible] quantum BAE, CAE in utraque positione differunt, [illegible]. Semper iteranda operatio, quia non admodum [illegible] cum affectionibus incedunt ob multiplicem mixtionem. [illegible] simplicem, i. e. motum simplicem, et apogaeum [illegible] regulam et merito quadrate falsam, quia 2 [illegible]. Tunc nobis licebit accipere EB totum [illegible] AC tantas, quantum fert proportio inventa. — [illegible] petis. Sit A Sol, C centrum viae Terrae, B [illegible] ipse Mars, ter eodem [illegible], E, F, G Terra [illegible] loco, ad quae loca Solis [illegible] Martis viae EK, FK, GK, [illegible] loci Martis [illegible] AK locus Martis [illegible] quocunque modo [illegible] observationes post 4 [illegible] et Mars semel in [illegible] tunc datur AK ad [illegible] KAE, KAF, KAG; [illegible] triangulorum cum AK [illegible]. Sit AK mensura [illegible], FA, GA in illa proportione.

Fig. 17.



[illegible] prodit, cetera in ipso orbe Solis vel Terrae. [illegible] (CAG) ex locis Solis, ergo et bases EF, FG, [illegible] FGA, quare differentia EGF. Sed ECF est [illegible] circumferentia, ergo in ECF [illegible] datur [illegible] CF [illegible] EFC [illegible], prius autem dabatur [illegible] CFA cum cruribus CF et FA [illegible] CA [illegible] in proportione FC, et FCA, [illegible] FA [illegible] GA [illegible]? [illegible] observationibus, et [illegible] [illegible] male [illegible] [illegible] [illegible]

Fig. 13.



eccentrici Martis in E puncto, BE [illegible]
Distantia A et B centrorum utriusque orbis [illegible]
tatem Solis integram.

Nota: Semidiameter minoris circuli [illegible]
centrorum utriusque orbis; Solis [illegible]
mel 1½ eccentricitatis Solis. Hinc etiam [illegible]
utriusque eccentricitatis in Marte, idque [illegible]

Cum igitur in parallaxibus tu ad [illegible]
laxin inquiras, quae ad C, deinde ad B [illegible]
fit, ut quanto centrum eccentrici Martis in [illegible]
proferatur quam debeat (videlicet ad [illegible]
hypothesis), tantum oportet te rursum [illegible]
vel quod idem est a distantia Martis a Terra [illegible]
laxeos angulum consequaris.

Hic tibi ostendo veram causam tuae subtractionis, quam tu ex tua [illegible]
defendere non poteris, et sic vides, centrum eccentrici in alio orbe [illegible]
Soli tribuis. Si mea Uranica scripta apud me [illegible], omnia [illegible]
hypothesin multis nocturnis et diurnis cogitationibus effinxi et puto [illegible]
Constitueram eam hicraditer effictam calculo comprobare, verum [illegible]
impediverunt; attamen valde placet, cum non vicaria hypothesi [illegible]

Commensurationem a me in hac constitutam [illegible]
Eccentricitatem Martis simplicem accepi 20050, semidiametrum [illegible]
minoris 3756; distantia centri orbis a Terra ad ½ eccentricitatis [illegible]
liam Martis aequabis per angulum CEB, per cognita latera CB, [illegible]
tricitati aequale et BE radium et angulum ECB. [illegible]
Ego reductione Tychoniana ad [illegible] hoc [illegible] sum, et [illegible]
hypothesi idem tu facias [illegible]
[illegible] (Keplerus: Ego vero non [illegible]
[illegible]

[illegible] nec illo in contrarium argumenta valebunt, si [illegible]

[illegible] de rebus astrologicis meteorologicisque, brevi post [illegible] Martem redit, praemissis et subjectis quaestionibus [illegible] (d. d. 18. Nov. 18. Dec. 1602, 2. 11. et 26. Feb. [illegible] epistola (paginarum in folio 26) data 4. Jul. 1603 [illegible] Vol. I. p. 324 et Vol. II. p. 95. 414. 425. 762. [illegible] haec sunt:

[illegible] 8. (18.) Nov. primo, In sola latitudine Martis [illegible] de ea sufficienter ex fide observationum Tychonis. [illegible] 8. (18.) Dec.: Placuerat bisectio eccentricitatis [illegible] perversae hypotheseos Martis. Movet te hypo[illegible] sed asciscens quasi in auxilium alteram succen[illegible] Audi Fabrici, sola vera sibi sufficit, sed tu et [illegible] dictata nequimus exsequi. Summa haec est: [illegible] appropinquat, aequales epicycli arcus conficiens [illegible] Ad singula vero momenta sui accessus ad Solem [illegible] Nam in apogaeo tarde (circa proprium [illegible] Et tamen ad singula momenta distantiae suae [illegible] celeritatis modulum. Collectione igitur omnium [illegible] infinitae, habetur virtutis effusae certo tempore [illegible] circa centrum eccentrici (adeoque et circa Solem) [illegible] vel infinita ejus viae puncta, vel arcus in minu[illegible] scrupula, computa: invenies idem, quod ego [illegible] vix dimidio scrupulo deficiente. Ego vero [illegible] ab apogaeo incipiendum et per minima [illegible] [illegible] hauseris. Ad compendiosam vero solutionem [illegible] hypotheseos et cujuslibet loci eccentrici [illegible] usque in apogaeum aliquid mihi deest; [illegible] viae ovalis seu facialis [illegible] in data ratione. Si figura esset [illegible] Apollonius satisfecissent.

[illegible] et propriis principiis demon[illegible] corporis sphaerae Martis sum [illegible] transformavi [illegible] [illegible] occuparet [illegible] [illegible] Martis motu [illegible]

[illegible]

quales, et lineas HG, TF &c. aequales, ubicunque Sol [illegible] consitat longe vel prope. Sunt autem HL, TL &c. omnes [illegible] apogaeum insensibiliter interea procedit. Neque tantum GH, [illegible] aequales erunt, sed etiam si ex Martis locis in medium Solis [illegible] ducerentur; quod addo, ne tibi suspicionem moveat, quasi [illegible] meo instituto non sit necessaria. Tertio ex calculo Tychonis [illegible] loca linearum AH, AT &c. sub fixis, quare et anguli HAT, [illegible] in Copernico $\vartheta\alpha\eta$, $\eta\alpha\varepsilon$ &c. (fig. ad Cap. XXIV.). Quarto ex [illegible] dantur certissima loca linearum AG, AF &c. sub fixis ad omnia [illegible] Quinto ϑ, η, ε, ζ vel H, T, E, S praesupposita sunt esse [illegible] uno circulo. Quare his plane assumtis, non pluribus non paucioribus [illegible] sitate triangulari datur proportio omnium AH, AT &c. ad HG, [illegible] etiam tentavi ductis rectis ex ♂ in locum Solis medium, [illegible] tricitatem 3600. Nam inventus est ille medius Sol inaequalis [illegible] Terra ideoque non vere esse medius Sol.

Porro ex datis longitudinibus AH, AT &c. sic ordinatarum [illegible] sario sequitur certa aliqua eccentricitas eaque 1800 proxime, [illegible] ratio naturalis suadet. Hic te, Fabrici, virum praestantem et [illegible] manniana argumentandi forma me oppugnes (conf. Vol. II. pag. [illegible] cipia videas ob oculos, quibus dissolutis ruet quod superaedi[illegible] stabit contra omnes Martiae hypotheseos furores. Nam [illegible] stantibus his stabilitur una locus lineae HG sub fixis [illegible] ex observatione haberi possit, si altera ex his 4 observationibus [illegible] [illegible] ubi Mars exuitur parallaxi et spectatur in suo vero [illegible] in quo etiam est post integras revolutiones, ubicunque [illegible] liter etiam proportio GH ad quamcunque ex A(α) ad [illegible] in quo sunt omnes H, T, E, S vel omnes ϑ, η, ε, ζ. [illegible] [illegible]

[illegible]

[illegible] Occurrendum est etiam [illegible] suspicioni: si [illegible] (quam tamen jam explicavi) esset in eccentri[illegible] ♂ et ☉ 48° distanti: impossibile igitur esset, [illegible] prodiret, qui continet apogaeum ☉, quod [illegible] ☉ habet. Atque ecce, in sequentibus tu te ipse [illegible], utramque inaequalitatem ab eccentricitate et ☉ et ♂ [illegible] confundi (v. s. p. 74), quamvis tu in alia materia usurpas. [illegible] ☉ speras aequantem Martis tollere, frustra hoc [illegible] ex nudis acronychiis exstruitur, ubi ☉ plane [illegible] ♂ ex ipso centro mundi spectaretur. Mi Fabrici: [illegible] tuum veritatis studium et sollicitudo. Ceterum [illegible] conjecturis et suspicionibus talibus. In aeternum nihil [illegible] aliqua certa et firma praemitteremus. At tu putas, [illegible] aliquam concinnam hypothesin, in ea excoquanda [illegible] ad observationes examinem. At [illegible] ubi hypothesis observationibus exstructa et con[illegible] gestio, si in ea naturae aliquam concinnitatem [illegible] plane concludo. Ego sesquianno prius mihi [illegible] physica [illegible], quam plane conclusissem, [illegible] prodibant. At errores erant in observationibus [illegible], quas tanto post tempore demum deprehendi. [illegible] prodiere, et in omnibus pragmatiis, quarum una [illegible] revolutionibus pertractavi. Tunc sane [illegible], concurrentibus confertim et cum impetu [illegible] physicis ratiocinationibus.

[illegible] continuo sermone sequar: [illegible] [illegible]), aequantis causam [illegible] aequantis, quo nobis ad [illegible] per [illegible] cau[illegible] argutur [illegible] planetae. [illegible] BC, [illegible]



[illegible] placueram. Si via [illegible]

pium petentes. Id probo, male habere meam eccentricitatem [illegible] destructis iis, quibus videas superaedificatam.

De aequipollentia hypotheseon sentio, plagam [illegible] minimo. Fateor, minimum aliquid mutandum est in [illegible] aequans Ptolemaicus et epicyclium Copernicanum paria [illegible] tamen plane aequipollebunt, si quis infra secunda scrupula [illegible] Causam quaeres in Copernico, ubi de trium superiorum [illegible] genere agit.

De miraculosa, ut ais, Martis latitudine identidem [illegible] nihil me ex mea hypothesi dixisse, adeoque ne quidem [illegible] ipsissimis observationibus cum esset Mars in ♐ [illegible]

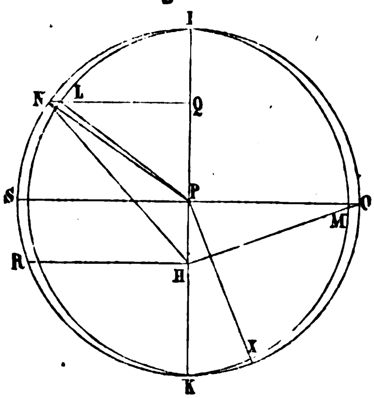
Revocas me (in literis d. 1/11. Febr.) ad theoriam Martis [illegible] Sequar te tamen. Causam petis probabilem, cur [illegible] acronychia eccentrici loca per certam eccentricitatem [illegible] quaerendis parallaxibus aliquid demam? Respondeo: [illegible] quidem abest, cum aucta utar eccentricitate, nec plane [illegible] reddi possunt, si libet ἀκριβολογεῖν: sed esset utendum [illegible] tricitate, sed per operationem plani ellipoidis seu [illegible] vicariae et auctam eccentricitatem compendiosius et [illegible] tilitatem descenditur. Aequipollent enim secundum magis [illegible] hypotheses. Primum, si utaris immanissima eccentricitate [illegible] apogaeo et perigaeo loca sequentur, dummodo apogaei [illegible] tempus verum habeatur. Reliqua loca omnia vitiosa [illegible] per eccentricitatem totalem quatuor loca in apogaeo, perigaeo [illegible] constitues vere, deerit aliquid locis caeteris omnibus [illegible] impedita fuerint veteres hac exigua defectu in Lunae [illegible] In ♂ adhuc major eccentricitas Solis [illegible] in [illegible]

Fig. 21.



Nam si BA tanta eccentricitas [illegible] angulus aequationis maximus [illegible] [illegible] CBG [illegible] AC, AD [illegible]

Fig. 22.



gitur hic epicyclicus Solarem in I. At
i, ubi motus circa Solem tardus, ibi et
ardus esset motus in epicyclo ad Solem,
unc INK perfectus circulus describeretur;
am, quia celerius descendit ad Solem,
ardius circumit, ideo ingreditur ad latus
, et hoc semper, usque in K tunc iterum
oincidit. Atque ego omnino persuadeor,
inc nasci motum apogaei, nondum tamen
onsideravi. Exerceare, quaeso, mecum
n dubium eventum. Esto ut ♂ tam
nagnam capiat temporis periodum pro
picyclio suo aequabiliter conficiendo,
uam magnum erat futurum tempus
estitutionis circa ☉, si totum circulum
erfectum permeasset. Jam vero, quia
oc non fit, non enim INKO viam permeat, sed ILKM, et vere planum
netitur tempus, ideo citius circa Solem vertitur ♂ quam epicyclum absolvat,
itius quam si in INKO circumisset. Quo enim propior Soli hoc celerior,
ropior autem in universum in ILKM. Ergo sic ♂ capiens in I et K
rincipiis periodi conjecturam celeritatis ex HI, HK, quasi totus circulus
it futurus, tardius venit ad initium et sic apogaeum promovetur. Atque
aec causa esto, cur omnia planetarum apogaea in consequentia moveantur.
Ecce quam feliciter pugnaverim; credis tu, me vicisse? Sane triumphum
anerem, nisi me moveret proportio. Nam in ♂ et ☿ eccentricitas est
naxima, celerrime igitur aliqua particula periodi conficeretur ab apogaeo,
Solis apogaeum tardissimum esset. Id falsum. Ducentis fere annis absol-
reretur periodus apogaei ♂, quia ILKNIOKM est fere centesima pars de
INKO. Maneat igitur haec lis sub judice. Sed ad rem. Cum igitur ut
planum ILKM sic tempora periodica (quia omnes distantiae sunt in plano
circuli) accumulentur in I, K, apogaeo et perigaeo, et diminuantur in longi-
tudinibus mediis, quare si totum tempus periodicum dividamus per planum
circuli, prodibit valor lineae, quae minor est quam PI, major quam PL.
Priusquam hoc pertexam, oportet aliquid interponere. Prius enim a vicaria
hypothesi in perfectum circulum ♂ motumque physicum, inde a perfecto
circulo in veram deficientem a circulo orbitam es traducendus. Igitur quia
BA (Fig. 21) nimis est magna eccentricitas, quam ut a parallaxibus annuis
tolerari possit (in hoc enim nodo haerentes Tychonianos inveni anno 1600.
Februario: Processerat negotium usque ad parallaxes annuas et etiam ad
latitudinem acronychiam visibilem. Haec duo non poterant conciliari a
Christiano Severini), et quia Ptolemaeus invenit, dimidium ipsius BA
tolerari in parallaxibus annuis, ideo conclusi ego de eo, quod jam pridem
agitaveram animo, ex plano anomaliam simplicem esse desumendam. Sit
enim anomalia simplex IHO (Fig. 22) et eccentricitas PH sit dimidium de
BA (Fig. 21) et sit jam IPO rectus. Sicut ergo IPO est quarta pars plani,
ita quarta pars anomaliae (h. e. 90°) ablata ab anomalia majori IHO, relin-
quit planum trianguli PHO, cujus angulus HPO et PO latus dantur. Prodit
ergo PH, quare et POH. Est autem POH aequationis pars una seu optica,
imminutio sc. anguli IPO, ut sit IHO. Contra planum IPO est aequationis
pars altera seu physica, excessus sc. temporis seu anomaliae simplicis IHO

super arcum IO seu ejus angulum genuinum IPO [illegible] anomaliae simplici, quae repraesentatur plano IHO, [illegible] IO arcus seu IPO angulus, de aspectu vero IHO [illegible] diligenter ad calculum revocat, is inveniet, sicut se [illegible] 360° sic se habere quam proxime aream IPO ad circulum [illegible] iterum anomaliam 360°. Quare in hac hypothesi physica [illegible] circulo angulus aequationis et area trianguli sui in hac [illegible] proxime faciunt aequalia adeoque tantundem, quantus [illegible] (Fig. 21) fere, ubi BA duplum est ad PH. Ergo hinc [illegible] talis: eccentricitas maxima serviens longitudinibus mediis [illegible] nychiis est dimidianda (pro annuis parallaxibus, [illegible] tricitas maxima, si fiat causa aequationis physicae, [illegible] (pro reddendis longitudinibus mediis aequatis in [illegible] physica serviens acronychiis servit etiam parallaxibus [illegible] Nam dimidiata (dimidiata id est bifariam dispertita [illegible] eccentri et centri mundi) sicut in priore praemissa [illegible] omnibus, Tychone observante in Marte praecipue.

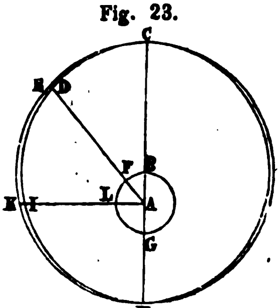
Atque haec quidem magno cum gaudio sic [illegible] nihil deesse huic considerationi. At non poteram acronychia [illegible] circuli intra 7 vel 8′ conciliare, si [illegible] [illegible]

[illegible]

INKO, tota anomalia significaret circuli aream, quae major est area ellipoidis, itaque divisa in aream circuli constituit PO. At jam non est circulus sed ellipoides, minus conficit et metitur totam anomaliam, ergo plus de anomalia cedet radio. Duobus igitur nominibus eccentricitas fit minor quam in perfecto circulo, cujus dixeramus esse dimidiam eccentricitatem ejus quae in vicaria. Nam primo quia ex divisione prodit quantitas radii PL, PX, ideo qui sunt supra PL et infra PX longiores, plus vindicant de anomalico tempore. Tempore igitur in medio attenuato circa L, M, eccentricitas quoque in proportione attenuabitur, praesertim cum ab I multo plures occurrant longiores quam a K. Deinde fit aequatio optica POH, et HPO rectus, debebat igitur ei aequalis esse PLH, ubi iterum HPL rectus, cum autem PO hoc est PN sit longior quam PL, erit igitur et PH in perfecto circulo longior quam PH in deficiente. Ex his etiam patet, cur prius in perfecto circulo observationes octantium conciliare non potuerim. Tempora enim accumulantur versus apogaeum et perigaeum contra omnem circuli legem. Vicaria vero hypothesis eo ipso in loco accommodata fuit, ubi maxima differentia, sc. in octantibus, quare nil mirum, vicariam officium in eccentricis locis facere. Haec omnia eo spectant, ut videas, qui fiat ut physica dimidiet aequantis eccentricitatem, cum vicaria plus dimidio sumat: etenim ne dubium existeret in ellipoide, prius demonstravi, hoc fieri debere in perfecto circulo, ut dimidium sumatur; postea in ellipoide minus etiam dimidio opus esse patuit.

Quid jam habes amplius quod te offendat? An quia compendiose nequit calculari? Nibil nobis, mi Fabrici, praeter geometriam deest. Doce me geometrice constituere, quadrare, secundum datam rationem secare ellipoides, statim docebo te ex genuina hypothesi calculare. Adeoque excita illa tua Belgica ingenia, ut hic me juvent. Eo usque perveni, ut sciam, circelli seu epicycli plano summam contineri defectus. Quomodo vero sit hoc spatiolum distribuendum ignoro, ut cuilibet portioni eccentrici plani suus defectus adjudicetur. Hoc scio mechanice seu per tentamenta numerorum, si ex A centro mundi lineas educam, et si BAGLFB aequale est spatium spatio CEKHIDC, majus tamen esse FAB spatio ECD, non obstante quod, si CAK rectus, tunc BFLAB aequale esse possit spatio KECDI et LAG spatio KHI, itaque brevius KHI aequale longiori KCI, quia hoc exilius, illud latius. Quodsi hoc solum sciretur, quanta esset portio ECD, KCI, computatio facilior esset quam in quavis alia hypothesi. Possumus tamen inire rationem calculi, distributa ellipoide orbita in partes 360 aequales, seu potius ex termino cujusque arcus educta linea ad centrum A. Tunc enim fient 360 aequebasia triangula, verticibus in A Sole coëuntia. Sciturque primi altitudo AC, fingitur alterum crus aequealtum, quia parum deest. Datur igitur area trianguli primi in proportione areae CKH seu CIH subtracto defectu. Ex quantitate hujus trianguli datur tempus seu anomalia, ex anomalia altitudo secundi trianguli, ex altitudine area, ex area tempus et anomalia, quae juncta priori anomaliae ostendit altitudinem tertii trianguli, et sic consequenter usque ad 360. Praecipere equidem possum, tu exsequere.

Fig. 23.



Describis mihi et tuam hypothesin et petis, ut calculo examinem. Sed

quia [illegible], te sperare satisfacturam observationibus [illegible] effinxisse: non faciam, inutilis labor. [illegible] etiam [illegible] ut tu praeconcipio integram hypothesin, quam [illegible] Nam fallet nos aeternum spes haec. Pauca pono [illegible] sequer observationes. [illegible]

Ad ultimas 7. (17.) Maj. 1608.

De computanda distantia Solis et Terrae quaeris [illegible] mediis, unum optare. At ego ne confunderem, tertio loco [illegible] quaerendae distantiae Solis et Martis ablegavi. [illegible] si minuta secternur, habet hanc ipsam similem operationem [illegible] est. Secundus vero compendiosus quidem et in [illegible] tamen Solem in operatione a similitudine ceterorum [illegible]

Igitur hoc habe praeceptum: cognito vero loco Solis [illegible] Terra distantiam cognoscere, primum vide, quantum [illegible] deinde adde huic distantiae ab apogaeo dimidiam [illegible] tertio dic: ut sinus hujus auctae distantiae ab apogaeo [illegible] illius verae distantiae ab apogaeo ad distantiam Solis et [illegible] puto propemodum idem locum habiturum, ut ipse [illegible] autem nimia eccentricitas non fert hoc compendium, [illegible] modo Marti adscripto.

Fabricius, non exspectans Kepleri responsum, [illegible]

[illegible]

od Copernicus per subtensas in toto circulo facit? Quod si fieri potest, quaeritur quomodo? m ego magnam differentiam utriusque calculi invenio; quare unicum exemplum saltem clarando proponas. 2) Quaeritur, quomodo Tycho verum apogaeum venatus fuerit, quod o ex 3 acronychiis consequor? 3) ☍ mediae in abaco acronychio Tychoniano in tempore n se recte omnes habent."

His literis statim Fabricius sexto post die (4. Jul. 1603) alias subjunxit, quarum mma haec est: Gavisus sum magnopere, quod per te restitutus nobis esset Mars, sed udium meum post in majorem tristitiam conversum fuit, cum per experimenta varia cogscerem, observationes tuis hypothesibus non respondere.

Deinde repetens exempla annorum 1587 et 1602 pergit: Cum tua hypothesis apud in dubium venisset, ego inquisivi in illius fundamenta per observationes certas et cognovi otum ♂ adeo implicitum et varium, ut paene desperaverim de motuum restauratione per am conficienda.

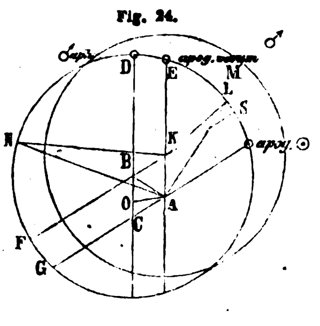
Tu duplici correctione inaequalitati ♂ consulere vis: 1) correctione distantiarum a Sole orbis annui. Ego omnino puto, distantias retinendas esse (cum in prosthaph. acronychiarum time respondeant) et potius de causa inaequalitatis orbis annui cogitandum esse. Tu vero orbem ⊙ loco epicycli ♂ habeas, ex una correctione duplicem facere cogeris et tamen non satisfacis. Quare ut omisso orbe annuo ⊙ proprium ♂ fabrices suadeo et res ipsa bet, cum coelo non satisfaciat. Nam hanc solam esse causam duplicis tuae hypotheseos nstituendae video, quod ♂ orbi annuo alligare vis; facis idcirco dimidiam eccentricitatem , ut ♂ sic consulas, sed frustra. Nam dimidia illa eccentricitas Solaris non satisfacit ad aequalitatem orbis excusandam nec mutilatio illa distantiarum a Sole. Quare ut retentis stantiis cogites primum de varietate epicycli vel orbis moneo. Inaequalitas a te constituta ne varietatem non excusat.

In margine addit Fabricius: quae de orbis inaequalitate, non ab apogaeo ⊙ sed ♂ cipienda scripseram (delevit dimidium eorum, quae in priori folio scripserat), falsa postea gnovi et paulo post (v. infra) clarius designavi.

Invenio maximam differentiam semidiametri orbis (retentis ubique distantiis eccentrici calculo provenientibus) in apogaeo ⊙; per acronychium ♂ illic existentis datur 6300, anno 87. 8. Jan. 2° 47′ ♎. Contra Marte in ipso hoc suo apogaeo existente datur icycli semidiameter 6587 (anno 97.); in perigaeo Solis existente Marte anno 91. datur midiameter 5700 circiter... Differentia semidiametri in apogaeo Solis et ipsius perigaeo 2° fere attingit. Causam hujus inaequalitatis veram ut dicas rogo. Debebat certe unus icyclus omnibus distantiis adhibitis ubique convenire, sed non facit.

Etiam hoc tibi proponere placuit, quod in exercitationibus meis Martialibus cognovi, eccentricitate Martis et angulo inter ⊙ et ♂ apogaea interjecto quidquam provenire, od ulteriori speculationi inservire possit. Sit CB eccenicitas ♂ 11613, angulus BCA 53° 30′ c.; ut ergo ngulus A ad BC sic angulus C ad AB et B ad AC: 907, quod fere convenit cum altera tua eccentricitate ♂. idetur igitur, Solem esse causam duplicis eccentricitatis vel impliciti ejus motus.

Fig. 24.



Deinde dicis, eccentricitatem distantiarum verarum sse 9165; at ex angulo inter duo apogaea ⊙ et ♂ er eccentricitatem ♂ 11613 datur 9500 (BA). Vide gitur mi Keplere, quid haec tuae speculationi afferant, it veras causas hypothesis tuae et ejus constituendae eram rationem tandem cognoscas. Certe si hac ratione quidquam a Sole et hoc angulo proveniret in Martis motu, tunc dubium non esset, mutato hoc angulo variari etiam aequantis eccentricitatem et distantiarum tuarum eccentricitatem. Quodsi quoque aphelii ♂ lineam per punctum A (ac si illic Terra esset, non in C, ut hactenus opinati sunt) duxeris, videbis etiam normam motus et simul abditas causas quorundam. At judico, epicyclum assumendum esse abjecto orbe Solis, et melius omnium ratio dari poterit.

Miror cur non accommodes tuam restitutionem ad modum Tychonis vel Ptolemaei potius, quod ut facias rogo; sic plures habebis tuae sententiae astipulatores aliquando.

Vide mi suavissime Keplere, haec candide, amice et libere tibi aperio, ut juvem tuos Herculeos labores, quos jam ipse per integrum mensem magno volumine conscripto expertus sum et eo magis miror. Ego in mille formis observationes accommodavi, sed per omnia nullae consensere. Video omnium primo acronychia (☍), ejus epicyclos vel semidiametros

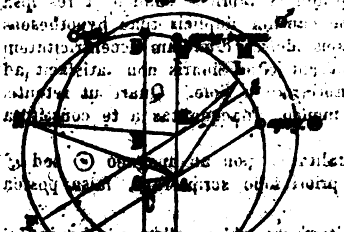
ita constituendae ex illis, ut exacte conveniant, et huic causa [illegible] sumus. Post ad examinationem □ et △ progrediendum, [illegible]

Quid de his sentias velim libere dicas, expecto judicium [illegible] ad unum redigas res ipsa postulat, [illegible] illa duplicitas [illegible] tuarum hypothesium. Si vera est, oportet partes omnes [illegible] et [illegible]

Proponitur tibi quaestio, Keplere doctissime: cur ex pro[illegible] utrinque propioribus datur simplex vel tota eccentricitas ♂ [illegible] maxima, contra in prosthaphaeresibus perigaeo ⊙ propioribus [illegible] utriusque 1890, quales radius habet 100000. Majorque [illegible] ⊙ Tychoniano et prosthaphaeresi in apogaeo ♂ 20064, [illegible] si una et eadem semper manet et est eccentricitas ♂, [illegible] simplicem motum utriusque eccentricitatis me remitto, [illegible] Per priora etiam hoc adstipulatur ex apogaei ⊙ linea aliquid [illegible] Licet illud in orbe ⊙ sit, quemadmodum putem, sed quod [illegible] sinistram a linea apogaei ⊙ propior sit ⊙. [illegible]

Quaero quoque a te, [illegible] Tycho [illegible]

Fig. 25.



Quodsi CB [illegible] Terras a centro eccentrici [illegible] et tanto propior [illegible] Si vero CB tota eccentricitas [illegible] aequabilem aequantis eccentric[illegible] est apogaeo vero E [illegible] duplicem eccentricitatem [illegible] Terra non ad integram [illegible] [illegible] Haec quaeso [illegible] quid valeant, [illegible] [illegible]

[illegible]

[illegible] velim ostendas. Cupio quoque scire, ad quid cognitio trianguli [illegible] quoque singularem delineationem et mentionem facias? [illegible] videtur esse. Nam cognito angulo EKA, differentia [illegible] et [illegible] ejusdem, sic angulo EEA, quem constituit [illegible] et [illegible] ♂, dabitur etiam EAK tertius et in proportione [illegible] quaeque AE et in reliquis FA, GA, quorum cognitio [illegible]

[illegible] Dantur anguli EFA, FGA, EGA, quare differentia [illegible] EGF [illegible], sic nempe reliqui EFC et FEC in [illegible]. At idem non [illegible] in △ EFA, [illegible] EFA et FEA haberi possint. Quaeritur an non eadem [illegible] EFA et FEA inquirantur. Cupio de his tuam resolutionem [illegible] et [illegible] parallaxes adhibeas, cum ex una acronychia et [illegible] haberi posse videatur, ut ex AK et EK. Edoceas me [illegible] et rationem tuam. Puto, te singularia in his habere. [illegible] accepero, ego ex meis observationibus tribus (quarum [illegible] bisectionis inquiram; quam si invenero, omnibus modis [illegible] gloriam inventionis novae gratulabor. — Sed heus, [illegible] removendi. Si bisectio in ☉ vera est, [illegible] Martis in orbe annuo Solis inquirenda sunt, non ut in [illegible] illa juxta tuam hypothesin inquiruntur in circulo OKH [illegible] veritati observationum sic respondere dices? Et bisectio [illegible] ovali, vel ex eo oritur vel eum praesupponit, [illegible] hinc [illegible] illa eccentricitatis pro distantiis ♂ [illegible] posita bisectione in ☉, pro distantiis illius a [illegible] erit.

[illegible] reddit. Secundum, quod in quibusdam exemplis [illegible] ad 25—30″ [illegible]. Videris tu quidem [illegible], sed non puto illa [illegible] differentiam [illegible] in geometricis, quales vix alibi tanto numero [illegible] conatibus meis [illegible] aliquid [illegible]. Quare [illegible]

[illegible]

Ego mi Fabrici huic ipsi omnino vicinissimam in[illegible] (1587. 5. Mart. vid. Cap. XV.). Prodigiosum vero errorem [illegible] non agnoscat. Itaque vide, ut calculo probe fueris [illegible] ad ea revolvitur hypothesis mea per calculum, unde fa[illegible]

Producis et tuam 18. Jun. 1602. h. 10: ♂ in 27° [illegible] hypothesin dare 28° 12′, alibi 28° 6′ (in literis 4. [illegible] putavi, invenio ♂ in 26° 45½′ ♍, lat. 0° 21′ [illegible] tu deducendo observationem ad eclipticam integro gradu [illegible] tantum auctus es, unde et latitudo vitiosa prodiit. Probo [illegible] 89, quando ♂ in consimilibus locis semper minus habuit in [illegible] vationibus Tychonis quam in Magino. Hoc loco [illegible] habere; haberet autem, si tua observatio rite haberet [illegible] unum in instrumento numerando praeterieris. Scribe mihi [illegible] ipsam. Alterum enim argumentum duco ex latitudine. [illegible] trici est in 7° 44′ ♍, ejus nodus in 16° 15′ ♏, ergo [illegible] 18′; compertum enim habeo, quoties in nodum incidit [illegible] ubicunque Terra versetur. At cum sit pene in □ ☉, [illegible] natio a latitudine. Falsum igitur latitudinem esse 1° [illegible]

Quaeris (p. 84.) cur Copernicus et alii inquirant [illegible] semel, quae tamen mutetur in omnibus locis? [illegible] ponunt, recte faciunt. Sic autem procedunt. Primo [illegible] tatis Martis proportionem ad orbem, quam assumunt 1000[illegible] eccentricum et orbem annuum esse perfectum circulum [illegible] ad quodvis momentum distantia centri orbis annui a T[illegible] qualium mediocris est 100000. Per hanc igitur [illegible] cium proportionem orbis annui ad illam distantiam [illegible] [illegible] 100000. Manet igitur [illegible] non manet proportio orbis annui ad quamcunque hujus[illegible]

[illegible]

insistere cum Ptolemaeo. Ptolemaeus primum crasso modo, supposita simplici eccentricitatis hypothesi, quaerit eccentricitatem invenitque quintam semidiametri partem. Jam non expeditis omnibus circa eccentricum, statim accedit orbem annuum seu epicyclum in apogaeo et perigaeo eccentrici constitutum, ubi parum in longum aberratur, invenitque simplicem eccentricitatem prius crasse constitutam non posse ab epicyclo tolerari, nisi ex parte praecise dimidia. Jam igitur rursum aggreditur ordinationem eccentrici, et quasi per falsi regulam iteratis operationibus in una qualibet prosthaphaeresi constituenda sudat, donec eam sat praecisam esse putet. Aliter Copernicus et vitiose, hoc est minus docte quam Ptolemaeus. Credit enim acronychiis solis non consulto epicyclo, putans se in hoc Ptolemaeum corrigere, et suspectam habens ejus relationem sine demonstrationibus observationum.

Puto te in altera assignatarum causarum peccasse, dum exstruis semidiametrum annui orbis. Accedit tamen et haec certa erroris causa: si Marte in certo loco eccentrici (existente), puta in long. media, bis exstruis orbem annuum, Sole non in eodem sui orbis loco versante, invenies hic quoque aliam atque aliam semidiametrum, quia re vera epicyclus Martis est eccentricus, h. e. nihil aliud quam ipse Solis orbis cum dimidiata eccentricitate. Propterea ego ex tribus hujusmodi diversis semidiametris orbis annui quaero eccentricitatem ejus et apogaeum, et invenio hoc idem cum Terreno, illam dimidiatam Solis. Quod tu in triangulo rectangulo inter centra, cujus alter angulus distantia apogaeorum, invenis vicinum aliquem numerum meo numero, id plane accidentarium est nec quidquam movet. Nam si divellerentur apogaea longius, variaretur hic tuus numerus, manente meo ex acronychiis deducto, quod quidem ipse olfecisti. Miror tamen propinquitatem (9165, 9500), sed scio connexionem nullam esse. Triangulo hoc usus ego sum in Mysterio ejusque tabella majore aliqua. Ab eodem etiam incepi anno 1600 Martios meos labores, ut videbis in Commentariis.

Dabitur opera Fabrici jamque cum Tychone conventum est, ut omnes demonstrationes in tribus hypothesium formis expediantur. (v. s. p. 85.)

Censes acronychion hypothesin prius exacte constituendam, tam quoad loca longitudinis quam quoad distantias; inde progrediendum ad varia loca orbis annui eaque inquirenda; et quaeris quid de hac tua methodo sentiam?

Omnino ab acronychiis incipiendum ob simplicitatem, quia loca statim ex observatione patent. Ergo invenienda hypothesis ex iis, quae locum eccentricum monstret ad quodcunque tempus, etiam cum non est ibi acronychia oppositio. De distantiis vero acronychiis non reddimur admodum certi, nisi nonnihil ex latitudinibus, ubi tamen praesupponuntur multa. Oportet ergo distantias venari ex parallaxibus. At si simpliciter procedas per unam parallaxin et locum eccentricum, duo praesupponis; 1) locum hypotheseos valere etiam cum non sit oppositio acronychia, quod tamen initio nescitur; 2) praesupponis distantiam ☉ et ♂ seu semidiametrum epicycli, planetam vehentis, perpetuo esse eandem, quod falsum est. Itaque ego primo omnium ex trinis parallaxibus ♂ eodem eccentrici loco quaero eccentricitatem orbis annui, tunc postea possum adhibere justas distantias, si opus esset. Non amplius vero opus est. Eadem enim opera elicio et proportionem orbis annui ad illam distantiam ♂ et ☉: quodsi quartam et quintam et plures adsciscam parallaxes ad eundem eccentrici locum, tanto magis fio certior, eundem eccentrici locum et eandem ejus distantiam a ☉ valere, ubicunque Sol sit, et sic se ipso stare eccentricum ♂, nec ullam subire inaequalitatem

a ☉ vel ejus apogaeo pendentem. Quin etiam, [illegible] eccentricitate ☉, possum jam, si maxime acronychiae [illegible] loca investigare quotcunque opus est ex binis acronychiis [illegible]

Sed pergo in eccentrici distantiis; ubi multas [illegible] eccentrici ambitum investigavero, facile patet, et ubi sit [illegible] eccentricitas et an via ovalis. Tunc igitur hypothesin [illegible] omnes hasce distantias repraesentet. Hanc hypothesin [illegible] oportet sic esse comparatam, ut constet [illegible] tries reddi. At non est summe necessarium, ut calculi [illegible] adspicimus, ad quas ob defectum mediorum [illegible] plurimum laboro, ut calculo loca eccentrica, id est [illegible] eccentri ex distantiarum hypothesi condam. Despero [illegible] ut aliis hypothesibus fieri potest. [illegible] gradu spero me olim exstructurum. [illegible]

Cur ex prosthaphaeresi ♂ [illegible] apogaeo Solis [illegible] tricitas major, quaeris (v. s. p. 86.). Ego vero dubito [illegible] [illegible] si tanquam in simplici [illegible] longitudinis mediae, majorem invenies [illegible] [illegible] prosthaphaeresibus apogaeo [illegible] cum [illegible] ♉ et ♊ sit longitudo ♂ media ☉ [illegible] [illegible] ☉ [illegible] Cur autem minor [illegible]

[illegible]

[illegible] et [illegible] EKF, [illegible] sic (sic) KEF ad KF. [illegible] EFA [illegible] observatione [illegible] KAF [illegible] et KA [illegible] autem AF sub fixis, [illegible] EGF, quia sine hoc [illegible] ⊙ eccentricitatem, quia [illegible], sed duplus EGF [illegible] centri distantia ab [illegible] centri eccentrici ⊙ [illegible].

Fig. [illegible]



[illegible] ECF est duplus EGF circumferentialis, [illegible] quia EG, GF crura aequalia; ex subtractione ECF [illegible] habetur E vel F. Non sic in EAF, [illegible] inaequalia crura; residuum igitur non potest aequa-[illegible] nota ex [illegible] cognitione triangulorum doctrinae. [illegible] p. 87) adhibeo pro inquisitione [illegible] ut ex tribus punctis [illegible] est eccentricitas quaerenda. (Quarta est probationis [illegible].) Tria puncta ponunt centrum, duo non [illegible].

[illegible] parallaxis; datur quidem inde [illegible] Nam [illegible] Si [illegible] ⊙ [illegible]

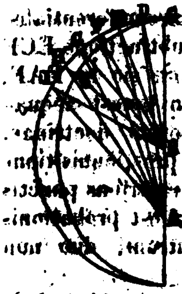
[illegible] et [illegible] igitur [illegible] Sed [illegible] parvam [illegible] inter [illegible]

♂ ⊙ metiantur tempora, et illae quidem ex hac [illegible] exstruantur. [illegible]

Petis ut ellipoides meum declarem. [illegible] putavi hactenus expetendum esse [illegible] videam). [illegible]

Scribe perfectum circulum eccentricitate 9165 de [illegible] (Epit. III, ?) quodvis punctum semicirculi [illegible] eccentro: jam adscribe ellipoides his legibus, ut [illegible] que distantiae ad mediocrem, [illegible] sit jam proportio [illegible] arcum ellipoidis respondentem distantiae, ubi fingitur [illegible]

Fig. 47.



lineis divisum; [illegible] putavi in ipso [illegible] Siquidem ex B centro [illegible] [illegible] imo ad infinita puncta aequalitate [illegible] ferentia, [illegible] quae dat proportio [illegible] BD, BE, BF, BG, BH, BI, [illegible] planum EGB. At non [illegible] punctis [illegible] in A ducas [illegible] est major quam [illegible] [illegible] compensare videtur [illegible] [illegible] [illegible] prima [illegible] geometricam descriptionem plani, quod [illegible] [illegible] [illegible] CI arcus circuli ad CK arcum [illegible]

[illegible]

... ellipsis aliis EB, ... HA, EA, sic GC ... minor, quam ... in planum aeque ... distantiae quae- ... connectantur lineis. ... (fig. 29), una recta, sed ... conchoidi similis. Spatium ... GDC et BB duplum ... quia ducta transversa ... triangulum Archimedeum. ... Ergo consentaneum (forsan ... etiam spatium sub GDC et AAA ... ad quaesitam nostram aream. ... hoc spatium illo, quia in punctis ... longior est quam EB, et OA ...

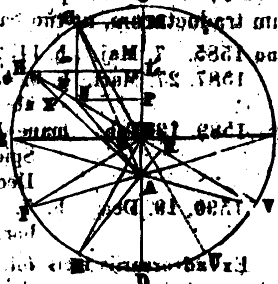
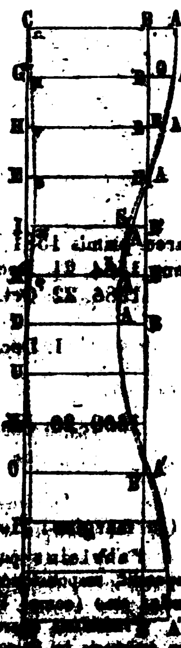


Fig. 29.



... tam est geometrica, quam ... contentus, cum Archimedes ... non tamen contentus cum hac ... quia praecipitur, ut per minima ... ut geometra aliquis me doceat ... parti ... circa cylindrum ... lineam conchoidea ... relinquo ...

Adscribam hic, pergit Keplerus, quadrigam [illegible] bitarum, ut fidere possis. Quibus subjungo quadrigam [illegible] usum traductarum, ut tuo calculo adjuves in tentandis [illegible]

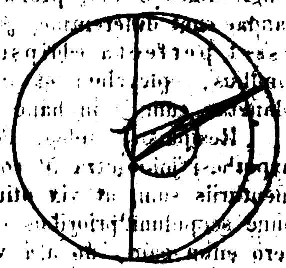
Anno 1585. 7. Maj. h. 11. 20′ distabat ♂ a Spica 52° 13′ 40″; [illegible]
1587. 27. Mart. h. 9. 45′ cum ♂ elevaretur 41° [illegible] dist. [illegible]
ab Arcturo 39° 53′. Declin. [illegible]
1589. 12. Feb. mane h. 5. 15′ cum ♂ elevaretur 19° [illegible]
Spicam 21° 7′ 40″, ab Ophiuchi [illegible]
Declin. 13° 33′.
1590. 19. Dec. h. 7. 15′. Inter Spicam et ♂ 15° [illegible]
bor. et ♂ 13° 3′ 30″. Decl. 11° [illegible]

Ex adversariis meis fol. 335 est sylloge observationum [illegible] nomina a diei in una revolutione periodica numero post [illegible] Tychone reperitur.

In revolutione 2. dies 483 — an. 1591 — [illegible]
„ — „ 486 — „ — — 31. [illegible]
„ 3. „ 482 — „ 1592 — 2. [illegible]
„ — „ 486 — „ — — [illegible]
„ 4. „ 483 — „ 1594 — 21. [illegible]
„ 5. „ 483 — „ 1596 — 2. [illegible]
„ — „ 486 — „ — — 10. [illegible]
„ 11. „ 335 — „ 1598 — [illegible]
„ 12. „ 484 — „ 1600 — 16. [illegible]
„ — „ 486 — „ — — [illegible]

Cur [illegible] 1581 et sequentis 1582 et 1583 [illegible]

Anno 1584. 21. Dec. [illegible]
1596. 22. Oct. [illegible]
1. Dec. [illegible]
25° 12′ 15″. Declin. 6° 2′ 15″ [illegible]



[illegible] huc illuc. Juvantur autem prolongatio [illegible] dibus. Sic igitur est, mi Fabrici. Negativa [illegible] argumentis et ovalitas frustra te concludere [illegible] affirmativa harum distantiarum ex ratiocinatione mea [illegible] vitiose: Kepleriana ovalitas nimium [illegible], ergo nulla pl[illegible] Ego aeque vitiose: Ovalitas est aliqua, ergo haec [illegible] motus epicycli monstrat. In dimensione orbis [illegible] 1000 [illegible] prolongat circ. 800 aut 900 nimis. Ovalitas mea [illegible] Veritas est in medio, propior tamen ovalitati meae. [illegible] longitudines medias prolongandae, sed etiam [illegible] tandae sunt differentiae, quam mea fert ovalis [illegible] esset perfecta ellipsis. Sed nihildum circa [illegible] similius, epicyclum et in aphelio et in perihelio [illegible] planetae cum ☽ in hanc societatem Variationis Tycho[illegible]

Resipuisti, video, cum tua observatione anni [illegible] hypothesi jam intra 5′ concilias; atque hoc dixeram [illegible] mentariis sum, ut vix otium habeam scribendi. [illegible] hunc scopulum prioribus expeditis. In ipsa [illegible] sero enim eam, ut alii videant, [illegible] hospes per arcanos aditus sese in meas aedes [illegible] 3. Dec. [illegible] die ♀ mane quadrante ante [illegible] Fridericus Keplerus. Ante [illegible] scripsi tabulas Martis [illegible] passim [illegible] tionibus [illegible] nisi circa stationes. [illegible] cunque mutata tabella [illegible] O [illegible] de quo [illegible] suspicaris. Sed tamen [illegible] futurum existimas.

[illegible]

[illegible] columnae ... secundo ... [illegible] anguli ad [illegible] Jam quia non tantum habeo gradum unum [illegible], sed etiam 11′ 11″, rursum ingredior per [illegible] et quaero 11′ aut certitudinis causa quadruplum [illegible] quae invenio in columna 52 [illegible] quae e regione [illegible] 2° 48′, cujus pars quinta est 33″. Ergo haec [illegible]

[illegible] Vel sic: 1° 32′ [illegible]

1. 6	2. [illegible]
11.	33
11	[illegible]
1° 32′ 33″.	

[illegible] 1° 32′ 33″ latitudo vera.

[illegible] Veruli, p. [illegible] 439, 697, 753. [illegible] Kepler[illegible] d. 4/14. Jan. 1606. Quod in hypothesibus [illegible] nullas [illegible] deprehendam, valde gavisus sum. [illegible] anni 95, quae similis est constitutioni [illegible] [illegible]

[illegible]

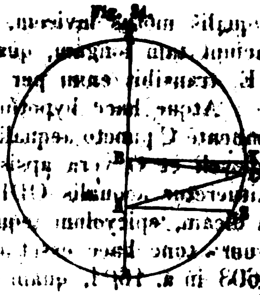
[illegible] aliàs. [illegible] facit. Neque tamen ego pro me dico, cum [illegible] et sic aliorum oculis me videre oportet. Curabo tamen [illegible] mihi fieri ad ☉ observationes, cum [illegible] differentiam.

Quae hac secutae sunt literae (d. 10/20. Feb. 1606) [illegible] continent (comp. Vol. I, p. 352.). Ad Martem vero redit Fabricius in [illegible] his more consueto incipiens querelis: Adeone ille tuus Uranicus [illegible] tot meis literis ne unis quidem tanto tempore respondere dignari [illegible] literarum cumulum in hoc silentio Uranico colligere, quam laborem [illegible] Cave igitur tibi! Sed dices, differ, habent parvae commoda [illegible] quiesco; Mars et Ars, de quibus in Commentariis promisisti [illegible] exspectatum reddunt, tantum abest ut suspectum faciant. Perge ergo [illegible] et Martialibus frui, ita tamen ut eorum aliquando nos (quod summe [illegible]) reddas et exspectationem meam non omnino in respondendo frustreris. [illegible] proximas meas literas, longiores [illegible] Frankofurtensibus [illegible] transmissas. [illegible] quod respondeas.

[illegible]

[illegible]

Fig. [illegible]



[illegible] ♂ [illegible] angulus BCA [illegible] ♂ a ☉ [illegible] fiat?

[illegible] hoc BEAS [illegible] in hoc angulo [illegible] cum angulo [illegible]

[illegible] hypothesi [illegible] anomalia [illegible] observationem loci [illegible] ☉ et videbis quam [illegible]

[illegible] satis [illegible]

[illegible] 1605 [illegible] omnia quae Fabricius dubia protulerat [illegible] (v. Vol. I, p. [illegible] ss. et Vol. II, p. 97 ss. [illegible]

[illegible] Kepleri [illegible] Marte [illegible] accipias. Cum viderem distan[illegible] [illegible] pene tantum peccare in [illegible] in prosthaphaeresibus orbis anni, [illegible] quantum ellipsis mea (quae perparum ab [illegible] principsi, peccabat in defectu [illegible] medam; circulus et ellipsis sunt ex eodem [illegible] in diversa, ergo veritas consistit in [illegible] ellipsis. Itaque omnino Martis [illegible] dimidiae latitudinis pristinae ellipseos. Erat [illegible] ergo debuit esse [illegible] 429, quae est [illegible] mediis [illegible] perfecto circulo [illegible] At vide [illegible] ego [illegible] imo vide quam [illegible] secundum illud [illegible] qui nunquam dubitas, [illegible] 858 [illegible]

[illegible]

aequalis motus invicem, qui in se est inaequalis. [illegible] faciunt tam longam, quam si ex C eccentricus [illegible] AE, transibit enim per F.

Atque haec hypothesis falsa est, quod anno 16[illegible] manente C puncto aequalitatis ipsius D linea ADQ [illegible] epicycli et O vera apsis epicycli, sic ut ipsi DC[illegible] stitueretur aequalis ODF, et DF inclinaretur ad AC [illegible] si dicam, epicyclum aequalibus temporibus movere [illegible] trum: tunc haec esset quam proxima hypothesis, qu[illegible] 1603 in a. 1604, quam et tu tenes. Et haberet [illegible] At deprehendo ex primae excessu secundae defectu [illegible] dam vel bisecandam in B, ut ducta BDS sit apsis epic[illegible] C [illegible] centrum aequalitatis D. Sed jam SDF [illegible] malias mediae: et DF minus inclinatur ad AC quam [illegible] hypothesi jam quam proxime vera distantia exstruitur [illegible] quam proxime vera coaequata. Dico quam proxime [illegible] vere, ut cum ex physicis aequationis computatio [illegible] hypothesis mihi qua in delineatione mea [illegible] non satisfecit, quod punctum B [illegible]

[illegible]

[illegible] vel [illegible] per tabulam [illegible] ex area trianguli [illegible] quae [illegible] et dispertire hanc summam per [illegible] in gradus redige et appone ad illos [illegible] juxta 90° anomaliae eccentri [illegible] 5° 18′ 30″. [illegible] mediae [illegible] 90, anomaliae eccentri [illegible] sic [illegible] cum apta [illegible] media, post major, conjectura [illegible] quanto [illegible] media mihi [illegible] 48° 46′, vellem [illegible] hic in summam [illegible] 5° 18′ 30″ [illegible] debet mihi relinquere 3° 46′ [illegible] bene [illegible] mediam anomaliam. Habita [illegible] 7071 [illegible] 420, [illegible] 7071 [illegible] 30408. Sume [illegible] eccentricitatem 9264 [illegible] ad [illegible] ad [illegible] ad semicirculum, [illegible] ut sin. tot. ad [illegible] distantiam ♂ a ☉. [illegible] eandem [illegible] cum

[illegible]

In ♓ 2 vel 3 decesse puto et huic et antiquis [illegible]
falsam assumtionem in ♓. Nam ♂ debuit [illegible]
latitudinem. Sed non video, quomodo corrigere [illegible]
mentum infertur locis reliquis. Et tamen [illegible]
efficere ad apparentiam 10—11'. Sed et aliud [illegible]
hypothesi: nempe quod ad insaniam usque [illegible]
confingere non possum, cur ♂, cui tanta [illegible] per DCE [illegible]
metro tribuebatur (res enim nobis ad visu [illegible] ad AC [illegible]
residebat), potius velit ire ellipsin vel ei [illegible]
pulo, virtutes magneticas non omnino [illegible]

Omitto capit magneticam vim [illegible]
mola: ut si globus ♂ haberet axem [illegible]
alterum fugientem, eoque ille porrigeretur [illegible] BDS [illegible]
dia vertatur in descendente semicirculo [illegible]
rigit polum appetentem versus ☉; itaque AC [illegible]
maxime in longitudine media, nihil in [illegible]
semicirculo aequaliter fugit a ☉. [illegible]
[illegible] Fabrici, dum tecum loquor [illegible]
[illegible] quae magnes aliquis fugit [illegible]
[illegible] quod DFA sit corpus [illegible]

Fig. 34.



[illegible] magneticum [illegible] Solem [illegible]

IN [illegible]
parva, imo fere [illegible]
sura; quid si [illegible]
[illegible]

[illegible] Soli [illegible] [illegible] partes [illegible]
[illegible] hic [illegible] in producenda anguli [illegible]
[illegible] anguli DBC complementum CB [illegible] hunc? Non
[illegible] minui, tunc plus illi [illegible]
[illegible] diminutionis, quam cum pene totus [illegible]mitur.
[illegible] DBC? [illegible] quod [illegible]
[illegible] (si [illegible] falsum hoc) [illegible] Sed quia [illegible]
[illegible] de observatione ♂ anno [illegible]
[illegible] Lucae bori et Spicae differre a loco, qui
[illegible] At ego nullam distantiam ♂ prodit a
[illegible] in principiis [illegible]
[illegible] eclipsium a Tychone prodita, citra [illegible]
[illegible] scrupulum [illegible] quidem.
[illegible] hic Tychone diligentiorem [illegible]
[illegible] et eam Tychonicae [illegible]
[illegible] etiam [illegible] discrepantia confirmatur [illegible]
[illegible] quidem est, dubitare [illegible]
[illegible] locum ☉ prodit. [illegible]
[illegible] observationes [illegible] ♂ [illegible]
[illegible] Terrae [illegible]
[illegible] Tychone [illegible] grave [illegible] De Solis
[illegible] in Opticis [illegible]
[illegible] obliquitate eclipticae [illegible]
[illegible]
[illegible] obliquitas eclipticae circa 90 [illegible] Inde
[illegible] ☉ [illegible]
[illegible]

appetentia tanta quanta AP. Aufer ab AP aequalem [illegible] AS, ergo SP est hic modulus appetentiae et AD [illegible] angulo nullo. Et AD : SP = BD : BF vel CN. Ergo [illegible] planetae ab apogaeo vel perigaeo metitur celeritatem [illegible]

Haec est demonstratio geometrica et certissima. [illegible] nostra bene haberent, omnino libratio fieret lege [illegible] apogaeo. Sed quia experientia et ellipsis per experientiam [illegible] bilis refragatur et vult librationem fieri per sinus [illegible] apogaeo, non per CN sed per NL, ergo principia [illegible] variari. Sumimus autem pro CN perpendicularem NL [illegible] etiam in principiis pro AD sumere debemus perpendicularem [illegible] dicendum est, etiam tunc esse planetam in apsidibus [illegible] perpendiculariter incidit linea ex Sole, sed tunc cum [illegible] Quod etsi primo intuitu cum magnetica virtute [illegible] pugnare videtur, tamen mirum in modum afficit. Nam [illegible]

[illegible]

[illegible] a septentrione per [illegible] in austrum, [illegible] causa [illegible], [illegible] accessus ad [illegible]? [illegible] in toto [illegible], in [illegible] partes [illegible] hanc causa [illegible] NB. [illegible]

[illegible] hac inquisitione redeamus ad schema corporis [illegible] versum IN [illegible] portiunculam librationis, [illegible] observationum. 2) Sinum rectum CN, vigore demon-[illegible], metiri fortitudinem accessus vel librationis. [illegible] contraria, et videtur quod non. Nam alia [illegible], alia mensura jam confectae particulae [illegible] librationem totam, IN partem competentem [illegible] momento. Hic DB repraesentat fortitudinem [illegible] in anguli CBI momento. At ut DB non [illegible] junctim, ita nec CN fortitudines omnes [illegible] colligas summam sinuum 90, quae est 5789[illegible] [illegible] quarum quidem effectus communis est libra-[illegible] ergo aliam si colligas summam sinuum ad omnes [illegible] portiunculam confectae librationis, quae si [illegible] est NL versus sinus, a quo stat experientia, [illegible] cum demonstratione librae. Videamus. Sit [illegible] 90 priorum est [illegible] 578 . . . . : [illegible] At sinus versus [illegible] est 13397, differentia [illegible] vere IN 20000 [illegible] 578 [illegible]

[illegible] adduximus optimis rationibus, [illegible] planetae [illegible] considerandum, ac si esset [illegible] faciat [illegible] virtutem [illegible] objectionem [illegible] in [illegible] relinquemus, [illegible] In principio, cum sinus sunt parvi [illegible] dimidio [illegible] 30. [illegible] 1° est 15, [illegible]

Solas, distantias libratorias [illegible] ab anno 82. in 85. Proportio tamen [illegible] paulo. Eccentricitas sc. 9300 circiter. Et [illegible] medium radium orbis Terreni proportio quae 2 ad 3, [illegible] de 100000 plus vel minus.

Hic confundam tuas literas ultimas primis. Quaeris [illegible] distantiam 100000? Quia hoc peculiare est [illegible] tota theoria Solis adhibeatur ad omnes planetas et sic [illegible] et Mercurium. Nam in Venere circellum libratorium [illegible] quam hoc ipsum, quod distantia a Terra medii puncti [illegible] non habet eadem. Convenit dimensio. Nam eccentricitas [illegible] Ptolemaeo 4170, semidiameter circelli illius est 2080. [illegible] tricitatem Solis, et ego utens distantia Solis a Terra [illegible] correctione) vel distantia Terrae a puncto repraesentante [illegible] (in correcta Copernicana forma), non [illegible] hoc quoque homine incredibilis, quod ad alienum orbem [illegible] causam conversionis. Habes unam causam, cur distantia [illegible] 100000. Altera: quia pulchrum, veras omnium siderum [illegible] proportionem ad invicem erat citra regulam de tri [illegible] quantum ♄ a ☉ 100000 tantum ♃ a ♃ est 400000, [illegible]

In [illegible] (p. [illegible]) errorem non [illegible] tamen [illegible] vera sit, anno 85. d. [illegible] [illegible] circa longitudinem medias [illegible] [illegible] declarabo [illegible] praecepitum in hoc exemplo, ut ex eo de [illegible]

[illegible]

... in ABC, 3 latera, ... inquirere DC ...

... de 182 ... respondente ...

... potest inquirere AC ...

... inquirere DC, sufficit ...

AC ... detur. Igitur

... AD ... 5878 ...

$\left(\text{tg. DCA} = \frac{45478}{100548}\right)$. Ergo A ...

... 7° 40′ 10″ ...

... invenimus

182. 44. 20	49. 19	7. 40. 40
30. 33	0. 32	25. 50. 51
1. 39. 3	1. 35. 18	181. [illegible] 19

☉ 182. 44. 16

25. 50. 51

[illegible] 10. 45. 7

Haec Keplerus. Fabricius respondit d. 11. (21.) Jan. [illegible] ♃ aut ♄ ex acronychiis longo temporum [illegible] [illegible] locus quaeratur, [illegible] acronycha [illegible] respondeat? Certum n. [illegible] [illegible] nychiis respondere non posse, propter motum [illegible] vationes in circulum et sic inquiris cetera. Existimo igitur non [illegible] eccentricitatem sic dari posse, quia unum ex altero dependet etc.

His addit Fabricius rationem „post multas cogitationes [illegible] eccentrici ♂ explicetur, subjungit vero [illegible] depinxi" correctionemque [illegible] addit: „[illegible] erit ad majora. Ego haec ob [illegible] motus [illegible] [illegible] (Comp. Vol. II, p. [illegible])

Deinde addit: Quando [illegible] et quando [illegible]

Nuper veram rationem mihi ostendere voluisti, quomodo [illegible] a ♂ cognoscenda circa 5—6° post [illegible] [illegible] et variis in illis, ut nihil [illegible] Ostendetur mihi [illegible] [illegible] in 90° distantiae ab aphelio usque ad 96° idque [illegible] [illegible]. [illegible] conjectura nuper inquirebas istum angulum, [illegible] dedisti. Certe ego invenio illic aliquid differentiae in observationibus, [illegible] in 96° distantiae ab aphelio more solito [illegible] inquiratur; [illegible] non video. In ceteris omnia optime observationibus congruunt. — [illegible]

Ad haec Keplerus non respondit, et Fabricius alias [illegible] ipse obmutuit neque per annum 1606. Keplerum iterum adiit. [illegible] dandi recepit initio anni 1607. eamque per annum 1608. [illegible] Keplerus in Martis Commentariis occupatus duas tantum [illegible] [illegible]

[illegible]

sufficere, ut hypotheses satisfaciant observatis, [illegible] fictas, [illegible]

Fig. 38.



Fabricius: [illegible] circulo CBT [illegible] in integrum [illegible] apocentricitatem [illegible] video. Si CBT est anomalia [illegible] BEA tota esse deberet [illegible] BC vera distantia. [illegible]

Keplerus: Quae subjicis [illegible] ex schemate hypotheses a [illegible] refutatione, ipse enim diligenti [illegible] Ellipsis est naturalis hypothesis, [illegible] amplexus est tantummodo [illegible] per se geometrice nequit, aliter in [illegible] nisi per circulum et communes ordinatim applicatas, [illegible] Verbi gratia, si dixeris 10° de circumferentia [illegible] loquaris, nam ellipsis non est longa 360° circuli; [illegible] longitudo, [illegible] puncta arcum 10, [illegible] arcum de circumferentia elliptica [illegible] [illegible] quid dixeris. Nam [illegible] [illegible] ET [illegible] arcum ellipsis [illegible]

[illegible]

[illegible] eiusdem [illegible] AEN [illegible] [illegible] eccentri EAF et [illegible] pars aequationis [illegible] trianguli aequatorii [illegible] vero pars optica aequationis. Atque sic [illegible] causae sunt aequationis. [illegible] Manente enim prima parte aequa[illegible] dicas, jam pars optica, [illegible] quantitate anguli CBE.

[illegible] consideraveris penitusque animo comprehenderis, [illegible] sed scies, quid quavis operatione [illegible] EBF [illegible] BAE, nam EAF per se [illegible] arcus CF et sic una tempus morae [illegible] ut quo [illegible] planeta distet hoc [illegible] non EBF sed CBF, [illegible] ut justam habeat distantiam non EB sed [illegible] idem planetae FC non FE.

[illegible]

[illegible] adhibitam [illegible] hypothesis [illegible] tiam [illegible] non praebet geometrica [illegible].

Keplerus: Non perpendis, Ptolemaeum [illegible] computanda eccentricitatem illam, quam insinuabant [illegible] idem [illegible] eccentricitatem per aequationes inventam [illegible] computandis: nam a centro eccentrici distantiae [illegible] est duplex eccentricitas prioris, aequationem [illegible] arguas, Ptolemaeum idem facientem argue. [illegible] ille duplicatam semel (duabus tamen, ut prius dictum [illegible] eodem redit. Deinde perpende causam. Natura [illegible] bis adhibere: nam primo eccentricitas facit planetas [illegible] sic naturaliter tardiores, quia sunt in virtute remissiori [illegible] tricitas facit etiam arcus optice breviores fieri. Non [illegible] ut, quod postulas, geometrica mera (h. e. ut mentem [illegible] primam, optice mera) sit hypothesis aequationum, exhibens [illegible] in angulo trianguli aequatorii stante ad circumferentiam [illegible] ellipsis. Si enim nihil nisi opticum, h. e. ut in [illegible] deretur calculum meum, excluderetur [illegible] physica [illegible] [illegible]

[illegible] supra anomaliam [illegible] et quia [illegible] seu tempus, [illegible] multiplicatione [illegible] huic anomaliae [illegible]

[illegible] ut Keplerus, [illegible] [illegible] principio [illegible] Ego [illegible] [illegible] simplicior fuerit, et veritas [illegible] per se simplex.

[illegible] meam praedicandam putas, si non repugnaret [illegible] omnem subtilitatem vel repugnantiam [illegible] Dum vero mihi Copernicanam subtilitatem [illegible] inepte facis, cum scias, quod tu damnes in [illegible] Cur igitur me hujus absurditatis vocas [illegible] philosopharis de simplicitate veritatis. Est natura [illegible] Nec aestimanda est haec ejus simplicitas ex [illegible] Et vero mirum, si simpliciores quis attu- [illegible] constitui, in quibus planeta primum facultate [illegible] magneticum et successu seculorum [illegible] virtute corporali magnetica ad Solem accedit [illegible] inclinationis axis ad Solem, tertio Sol planetam rapit [illegible] ejus. Haec est genuina simplicitas, in ipsis [illegible] paucis si jam multa sequuntur, aequationes [illegible] iter ellipticum, tunc ideo ob hos multiplices [illegible] esse simplicia? Oblitus es igitur Platonici illius:

[illegible] ad verarum hypothesium inventionem [illegible] [illegible] dimidia [illegible] [illegible] ad hypothesin ad Keplerum, [illegible]

[illegible] In his [illegible] per 4 [illegible]

[illegible] mihi [illegible] leges condendae hypo- [illegible] Directio [illegible] mihi [illegible] in Commentariis refutavi. Miseret [illegible] in genere — [illegible] quatenus ab homine [illegible]

[illegible] prodit aliquis [illegible] illa [illegible] AG [illegible] BA [illegible] situ [illegible] in H. [illegible]

distantiam 100000, causam conjeci hanc, quod libretur [illegible] epicycli ad Solem extensa, et in superiori quadrante [illegible] longe abest a Sole, quo pacto efficitur, ut aequaliter [illegible] eccentri et arcus fictitii illius epicycli, quorum signa [illegible] tiendum. Ulterius demonstratum habeo, si planeta [illegible] inclinationis axis ad Solem celerius vel tardius accedat [illegible] tionem effici quasi in diametro epicycli. Ergo concludi [illegible] gulorum ex tempore, h. e. ex data anomalia media non [illegible] tam, sed contra potius ex data anomalia eccentri deri [illegible] aequatam, id, inquam, ne mireris: nondum enim docuerunt [illegible] semicirculi planum in data ratione per datum diamet[illegible] nes puto poterunt, eo, quod cum lineae sectionum sint re[illegible] ex dimidio curva comprehendatur.

Fabricius: Tu indirecte procedis, triplicem constituendo [illegible] stationem coaequatam exhibes? Tu ex incerto et quasi falso [illegible] non potes ex vero verum, id est, ut consequentia [illegible] [illegible] ut res vera conveniat. [illegible] illas esse, ut, unde, cum [illegible] ellipsis tua.

Keplerus: Quaeris etiam de causa aequipollent[illegible] physicam, h. e. verissimam hypothesin. Non neglexi [illegible] sed peculiare caput feci, quod quia prolixum [illegible] tibi scire, quod inventa sit. [illegible] ♂ [illegible]

Fabricius: Si cum Copernico [illegible], proba inaequali[illegible] in planetis, vel si eam ostendere non potes, cum Tychone [illegible] [illegible]

Keplerus: De maxima ♂ latitudine [illegible] [illegible], hodie [illegible] [illegible]

Fabricius: [illegible]

[illegible]

[illegible] etiam cavendum, ne in FE numeremus tempus, sane et [illegible] motuum causis. Ergo quando planeta est [illegible] eius locum nequaquam investigo; itaque non [illegible] te doceam. Rursum tu dicis, FE simplicem [illegible], quam Graeci ὁμαλοποιον (?) vocant, simplex enim [illegible] dicitur, qui est a prima [illegible], cui adiuncta est prae- [illegible] igitur FE mediam et ad eam accommodas FD recte, [illegible] puta quantitate, et putas esse hanc, quam ego [illegible] coaequata. In his confunderis. Repetam enim [illegible] potuisses. Data anomalia eccentri elliptici FD, [illegible] arcu circuli, erit area EAF mensura anomaliae me- [illegible] coaequata. Datum ergo tempus redactum in [illegible] est in area perfecti circuli: quod quia [illegible] igitur faciendum. Nam tabulae facile con- [illegible] anomaliae eccentri FE (vel FD). Ergo dato [illegible] media, si tabulae factae non sunt, conjiciendum est [illegible] ED multiplicatus in valorem trianguli maximi BGA, [illegible] valorem △ BEA, quo excedit planum FAE sec- [illegible] sector FBE et arcus FE exprimuntur in hac [illegible] adiicitur ergo hic inventus valor trianguli BEA [illegible] sectorem FBE), ut habeatur area FAE, quae si [illegible] anomaliam coaequatam, tunc bene conjecimus. [illegible] inventa eccentri anomalia FD vel eius nomine [illegible] ad finem, vel per ED, quae habetur multi- [illegible] tabulae 432, vel melius per DA, quae habetur [illegible] EE in BA eccentricitatem, et quod prodit [illegible] ad radium. Illo modo per DC, CA notas, hac [illegible] coaequata DAC.

[illegible] in ED multiplicem et [illegible] circuli [illegible] circum- [illegible] distantiarum summam in arcu [illegible] distantiarum [illegible] circuli [illegible] area circuli [illegible] planeta ibi non versante, [illegible]

nullas areas adhibuerunt, factum est ex ignorantia [illegible] quas in lucem jam protuli. In omni novatione [illegible]

Fabricius: Necesse est, ut ♂ non sit in D sed in O [illegible] et distantiae convenire debent. At tu geometrice ex praesuppositis [illegible] quomodo sit in O, vel ostende, quomodo DO inquiratur, ut [illegible] det, et OAF verissima anomalia sit. Hoc velim mihi [illegible] curiositati meae.

Keplerus: Rursum me urges, ut geometrice [illegible] arcum DO, lineam AO, angulum OAF. Non est necesse [illegible] habet enim FO arcus ellipseos suum nomen aliud [illegible] debent ista ex FE exstrui.

Fabricius: Cur non ex centro eccentrici mediam aut [illegible] et inde ex puncto S usque O punctum verum loci ♂ in [illegible] eo puncto [illegible] et coaequatam anomaliam [illegible]

Keplerus: Jubes ex centro eccentrici constituere [illegible] sc. ut SBF sit media. Iniquum postulatum [illegible] perabile, ut faciat motum eccentrici aequalem non circa [illegible] proprium centrum. Sed forte hic te non intelligo, [illegible] telligentem, quam ego dico eccentri[illegible]. Tunc hoc quaeris [illegible] potius BE faciat anomaliam eccentri, et cur, quae [illegible] ea non [illegible] sectione sui cum elliptica locum [illegible] supra, FB se ipsa non est anomalia eccentri, cum [illegible] sed est FE [illegible] nomen ipsius FD. et [illegible] sed per EC [illegible] rationes non ex astronomia sed [illegible] Nihil interest astronomi, quale nomen cuilibet puncto [illegible] illius angulis et omnes distantias [illegible]. Si [illegible] [illegible] [illegible] [illegible] hunc [illegible] [illegible].

Fabricius: [illegible]

[illegible] ad G [illegible] accepi, et post complementum ad 180° in [illegible]. Cum igitur ∠ FGC confiteor cum FGA non [illegible] AEG, quae totam, nedum dimidiam eccentricitatem Solis [illegible]. Quaeritur igitur, qua ratione sectio aequantis ad angulos [illegible] simpliciter fiat vel an forte anguli, aut duo aequales adhuc [illegible] aliquam? Secundo quaeritur, an non idem sit, sive in [illegible] (respective tamen ad suos angulos relativos) adhibeatur? [illegible] ut possis illam ultimam a differentia duorum angulorum [illegible] diagnosis.

[illegible] latera EF, FG, EG inquirere jubeas, quae tamen absque [illegible] A haberi possint?

[illegible] tu mihi eccentrici punctum a me constitutas. Si [illegible] si tantum trium locorum Solis apparentium [illegible] per quae rationem operandi totam simpliciter tantum [illegible] et ad comprobandam etiam hypothesis tuae veritatem.

[illegible] 1. Aug. 1607): Absolutis iis, quae prioribus [illegible] ingeras, jam et illa subjungam, quae die Paschae [illegible] mitterem ad me Martis observationes a te ad- [illegible] eccentricitatem Tellaris seu Solis. Non inveni [illegible] bona est. Itaque vel in assumtis vel [illegible]. Confide igitur methodo et schemate [illegible]. Recta vero sentis, nihil esse com- [illegible] quaerendi eccentricitatem. Nam in illa [illegible] dentur anguli ad [illegible] centrum et [illegible] antiqua carere possumus. Nam nostra [illegible] tantum, illa centrum aequantis quod [illegible]

[illegible]

Quare aliquo impedimento non semper possum, quod mihi [illegible] Keplere, ut aperta via progrediaris et omnia ponas [illegible] sive per eccentricum potius circuli, ut rationem inde verum [illegible] Num tam modus adeo laboriosus et taediosus, at primo [illegible]

Keplerus: Miram tuam audaciam! [illegible] hypothesibus? Cum ego planetam a circulo dicam [illegible] dicis egredi. Obviant igitur invicem mens et tuus [illegible] tarum, vide uter fortior. Non fert meus hunc [illegible]

Sic quoque Alexandri pugnacem imitata [illegible]

> Simia fert humeris Martia tela suis,
> Tela; sed avulsos curva Jovis arbore ramos,
> Quos magno boreas impete stravit [illegible]
> Aut longa annorum series putredine: [illegible]
> Omnibus ut possint non tamen apta [illegible]

Ego mi Fabrici non ingenii volubilitate, non poetica [illegible] licentia sum inductus, ut dicerem, ingredi Martem [illegible] vaticinum Brahaeanarum [illegible] demonstrationesque [illegible] fingas, quod tibi animi libido dictet et fatigeris ad [illegible] perdens, hoc scio, te frustra fatigari et actum agere [illegible] et ingenii vim ad certa transfers, et quia [illegible] litis destituitur ab invicta fortitudine [illegible] deligendis laboribus; aggredere igitur Ephemerides [illegible] operam tibi non ita misere peream, quin potius [illegible] [illegible] recte habet, cujus [illegible] gationem. Causa enim, cur ex 3 acronychiis [illegible] cludi [illegible] quod [illegible] [illegible] operetur [illegible]

[illegible]

[illegible]. Sed nec illud capio, cur vel illam vel hanc dicas [illegible] facilitatio efficit nobis, si distantias ex perfecto [illegible] circuli 13' in observationibus extra situm acrony- [illegible] 13' ad aequationes eccentri, cum sint aequationes [illegible] cum posset tua speculatio e trivio arrepta, nisi a [illegible] securim affero radicitus illam excisuris et igne [illegible] tui injuria, qui tantis laboribus, ut ais, huc usque [illegible] eo pervenisti, ubi esses si interea dormivisses, [illegible] quid agendum, ut ista tua perficiantur. Stulte [illegible] Alexander nodum solvere Gordium. Itaque consulo [illegible]. Dico tibi, si centum superessent planetae, [illegible]- [illegible] haberemus quales in Marte, meis inventis ad [illegible] posse, siquidem illi naturam horum 7 plane- [illegible].

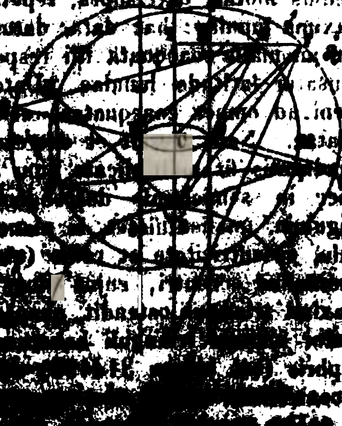
[illegible] animo (puto te a somno expergefactum, nam [illegible] tuos ipse labyrinthos et quaeris ex me, [illegible]- [illegible], quae datur dato aphelio, pervenire possit ad [illegible] mediam data eccentricitate. Omnium docui in Com- [illegible]. Via est geometrica, etsi longa, cum contra via a [illegible] sit [illegible] per regulam fictionum. [illegible] perscriptis nunc demum te monente de genuina [illegible] esset cogitandum.

[illegible] trium acronychiorum [illegible]. (Vide [illegible])

[illegible] 37° [illegible]

[illegible]

Keplerus: A dato aphelio, [illegible] medius motus [illegible], repetam [illegible] datur [illegible]



[illegible]

pus inter 1600 et 1604 est majus in proportione, [illegible] in postrema observatione in ♎, aut si praescirem [illegible] tatem Martis, viderem vero parum differre proportione[illegible] coaequates, hinc facile intelligerem, aphelium esse [illegible] posito ergo aphelio in 8° 38′ ♌, jam conjicerem [illegible] ea mediante tempore exstruerem pro 1604 aequatione[illegible] augendo eam quoad responderet observationi. Ubi [illegible] ipsa acronychia 8° 38′ ♌, poni motum medium ibidem, [illegible] tempore derivatur in 1604. Sic constituta eccentricitate [illegible] jam etiam computarem pro tertia anno 1595. Certum [illegible] computatum casurum ultra observationem ob vitium aphel[illegible] verse aphelium tantisper promoverem primo magnis [illegible] observationem 18° ♎; postquam res in contrarium caderet, [illegible] parare proportionalitate utens, donec ad rem veniretur.

Sed objicias, clarum quidem quid velim, ubi [illegible] ipsam observationem; quid vero, si extra? Tunc enim [illegible] Quid aliud nisi ut dicam sic: posito aphelio in 9° ♌, [illegible] in 19° ♎ fit tanta; quare posito aphelio in 19° ♎, [illegible] Dum igitur aphelium a 9° ♌ in 19° ♎ transponitur, [illegible] augetur, quanta fuit initio aequatio in 19° ♎. Ergo [illegible] [illegible] aphelium aequationes fere proportionantur [illegible] transpositio minor minus augmentum postulat [illegible] [illegible] est opus, ut jam videbis.

Fabricius: Tu duo, quae semper conjuncta sunt, [illegible] [illegible] conjungis. Ego vero hoc volo, ut cum aphelium [illegible] proportione respondeant, uno dato et illo per [illegible] de alterius veritate [illegible]. Quaero [illegible] vera utraque anomalia directe ratione ad [illegible] pervenire possis et quomodo?

Kepleras: An dato aphelio, [illegible] medius motus [illegible], repetam [illegible] [illegible]

[illegible] igitur minori eccentricitate et iisdem praeceptis facile [illegible] ad hypothesin, duabus observationibus [illegible]

[illegible]

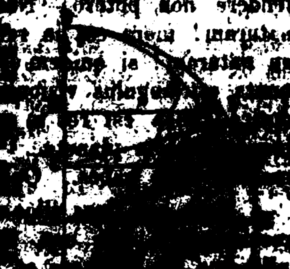
[illegible] circuli, quod non percipio, [illegible] per [illegible] super semicirculum. Non possum [illegible] duorum semicirculi arcuum, qui juncti semicirculum [illegible] non nomine tantum, sed in effectu [illegible]

[illegible]

[illegible] acronychiorum parum interest, [illegible] ab aequinoctio, modo si ab aequinoctio [illegible] tempori competens suis locis ab angulis auferatur, quod [illegible]

[illegible] etiam, vero aphelio dato circulum verum [illegible] positio ex 4 acronychiis, non dari verum [illegible] in commentariis [illegible] in circulum cogi posse. At de [illegible] observatione. Tuam demonstrationem [illegible] taediosa est [illegible]

[illegible]



[illegible] Ego puto, te [illegible] [illegible] geometricam colligere, non vero [illegible] mate ita esse aut fieri oportere. Implicatio quoque indirecta [illegible] et difficultatem maximam calculo iniicit, ita [illegible] esse. Addam, quae inter scribendum mihi [illegible] Triplicem tuam anomaliam sic intelligo: Constituis [illegible] AK [illegible] in ovali respondet C, ad hoc igitur punctum [illegible] [illegible] linea ab ovali puncto ad circulum [illegible] [illegible] K, erit punctum [illegible] [illegible] ad illud punctum [illegible] geometricae ♂ CAK [illegible] partem et AK distantiam [illegible]. At distantia debet [illegible] medium in ovali C non ad K [illegible] maior igitur erit [illegible] angulum CAK facere non opticum sed geometricum [illegible] ad K punctum proprius accedet ad C. At, mi Keplere, [illegible] aequationis [illegible] non oportet [illegible], sed per [illegible] [illegible]

Sic omnia ex uno fundamento procedunt. Sed forte [illegible] quod, magis opinor, [illegible]

Keplerus: [illegible] est [illegible] [illegible] bus, sed [illegible] [illegible] Veneris [illegible] [illegible] opinione circuli [illegible]

[illegible]

[illegible] voce media expresserunt Graecorum [illegible]. Ego [illegible] de novo traderem, sic ut mihi non esset opus loqui [illegible] vocibus aliis: Dicerem moram, arcum, angulum, cir- [illegible] nomen, morae mensuram, circuli aream.

[illegible] (28.) Apr. 1607 [illegible] ad [illegible] de [illegible] orbis annui inquirendam [illegible] pluribus [illegible] in locis Veneris et [illegible] a Keplero [illegible] repetitis sic concludit: Vale et [illegible]. De [illegible] Tengnagel et Ericksen valde sollicitus sum. [illegible]

[illegible] 1. (11.) Junii 1607 [illegible] Vir, amice colendissime [illegible]

[illegible] (N. Vol. II. p. [illegible]) sic pergit:

[illegible]

aequet excessum secantis? Ego quaestionem non [illegible] indignari et ellipsis et mensurae. Mars habet vim [illegible] ratione inclinationis axis magnetici ad Solem accedit, et [illegible] tudo accessus ratione physica mensuratur a sinu angul[illegible] hac fortitudinis variatione resultat, ultra singularis [illegible] in diametro epicycli (libratio, inquam, ad unguem talis, [illegible] cyclus in concentrico statuatur inaequalis motus, [illegible] circumferentia, sed in ejus diametro esse ponatur). [illegible] resultat ultra via elliptica et quantitas resectae lunulae [illegible] malia eccentri 90° absolvitur dimidia libratio, cum nondum [illegible] axis ad Solem inclinatio (ut nimirum supra libratio [illegible] sicut est et ipsa anomalia eccentri), ergo [illegible] planeta distat radio, quia absolvit semidiametrum librationis [illegible] ferentia mansisset epicycli, distinent secante aequ[illegible] plaque igitur, ubi maxime; excessu secantis supra radium [illegible] geometricaeque cohaerent, ut videbis cum Deo volente. [illegible]

[illegible]

[illegible], qui tolerari non potest in prosthaphaeresibus [illegible]. Nam circulus ipse tolerari non potest, sed pro eo [illegible] [illegible] ista, expecto igitur, quomodo salves [illegible].

[illegible] ad [illegible] acronychiorum Martis [illegible] [illegible] nata [illegible]. Nam certe habenda est praecessionis [illegible] arbitrio operantis. Soleo ego angulum [illegible] praecessione temporis interlapsi. Schema docebit [illegible]

[illegible] Martis editurus [illegible] scire cupio. [illegible] hoc ago, ut edam Commentaria Martis. Impe[illegible] et tamen inter spem metumque relinquit, dubium, [illegible] gravatim scribam. Et his literis quidem nihil [illegible]. Persecutus autem sum omnia, nisi quod [illegible]. Ureni latitudinem maximam in aphelio 4[illegible] [illegible], cum inclinatio utrinque sit 1° 51′ [illegible] alias. Unum tamen non possum non addere, [illegible] juxta elongationem in Aprili et Maio [illegible] per aliquot dies abfui.) Die 18. (28.) Maji [illegible] est in disco Solis &c. (Comp. vol. II, p. 106.) [illegible]. De Marte vero vix quidquam [illegible]. [illegible] laborem [illegible] impendam.

[illegible] Saturni, Jovis et Mercurii mitto. Ego remissior [illegible] instrumentis, supervixit mea observandi [illegible]

[illegible] interea [illegible] peregrinatus eorum in [illegible]

[illegible]

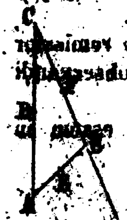
amicus [illegible]

J. Keplerus.

demum incipit ex novo meo incubitu et fotu, rursum [illegible] tanique progredior.

Naevae periculum valetudinis ex computationibus [illegible] festum venio, medicinam tamen suadeo. Abstineas a [illegible] thesi Martis, jam enim est constituta. Ego tantum [illegible] sufficit vel decem mortibus, et pervici per Dei gratiam [illegible] contentus esse possim meis inventis et quietate [illegible] [illegible], quiescere omnino non potui; ex praesenti igitur [illegible] [illegible] inventis.

Ex iis, quae scribis de Saturno, colligo, quae tibi causa [illegible] observata non mittas nec Jovis. Cupis aliquid [illegible] operis parte non vis habere [illegible]. Mihi hoc non [illegible] tibi [illegible] quaeritur [illegible], in causa est, quod [illegible] et conquirendi. Pati possum, et edas aliqua de Marte [illegible] mentaris vel post. Quidquam etiam, si brevibus [illegible] bis [illegible] meis Commentariis. Interim tuis [illegible] quas, quarum curam [illegible] permittis [illegible] tibi ipsi. [illegible] [illegible] Quid si mihi Deus hoc dedit, [illegible] observatis [illegible] ipse ergo [illegible] [illegible]



Cum tu habeas in Saturno [illegible] [illegible] [illegible] hypothesis [illegible] [illegible] hypothesi [illegible] Solis.

Sit B Sol, A centrum orbis Telluris [illegible] probe consentiunt. Sed hoc miror, cur [illegible] cur tibi longior AC [illegible] [illegible] observata.

[illegible] hoc suo modo in excessu circuli (per additionem partium lunulae ad [illegible] [illegible] pro libratione aphelii male collocavi, deinde correcta [illegible] [illegible] et alteri [illegible] facit, [illegible]

[illegible] Fabricius: [illegible] inter se et coelo consentiant, pluribus non [illegible] Fabricii vigilias multis annis in hac re exantlatas [illegible] secunda [illegible] quas diximus, correctionum, integrum [illegible] Keplere, nunc utriusque hypotheses, confer [illegible] et persuadendum convenientior. Hoc scio, [illegible] esse aut dari posse, et ad talem hypothesis [illegible] incepi. Per enim [illegible] sum verisi[illegible] observationibus verum aphelium et eccentricitas hactenus [illegible] per hanc meam hypothesin hoc fieri posse et in [illegible] posse, quod tu per 4 acronychia vix 6—8 diebus [illegible] non dubito, si examinaveris in praecipuis [illegible] in fine adjungere [illegible], [illegible] ego [illegible] et exemplis [illegible] haec mea inventa, [illegible] cum pari facilitate et [illegible] invenis, [illegible]. Ego autem [illegible] non potui aut [illegible] causas [illegible] latentium myste[illegible] Dei beneficio post [illegible] curas, innumeras [illegible] spatium tandem inveni.

[illegible] Keplere non haec tam est naturae conveniens, [illegible] hypothesis? Etsi maxime tua hypothesis salvet [illegible] est perplexa et operosa, ut vel primo [illegible]

[illegible]

[illegible] Keplerus, [illegible] [illegible] Fabricio hypothesin misso Cap. XLV, [illegible] careram, erroris hujus nimis certarum distantiarum in [illegible] potuit, &c.

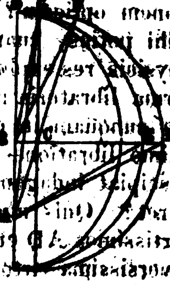
Hanc igitur Fabricius, [illegible] ut aphelii libratio super ☉ fit in contrarium [illegible]

Fig. [illegible]



[illegible]

[illegible] et partem aequationis physicam. [illegible] correctionem, [illegible] puto, aequalia [illegible] hypothesi exeunt et quae [illegible] Cum vero [illegible] hypothesi tuae, dicam. Constat mihi ex meo [illegible] maximam sic esse ad [illegible] Rectanguli (triangula) igitur ex [illegible] BA sunt similia, angulus igitur [illegible] BEA est quam proxime [illegible] BAG. Utrum autem [illegible] Primum si tu [illegible] aequationis, quam ego [illegible] cum mea, si modo [illegible] DE, non cum GH. [illegible] D, F, H signa [illegible] ovalis, [illegible] uterque circello duplici [illegible] Nosti enim aequi- [illegible] ovalis est potius [illegible] quam hypothesis. Ad illam [illegible] eccentrici, ego [illegible] physicas [illegible] in computando [illegible] Ptole- [illegible] laborem percipiendi [illegible] per circellum [illegible] qui ad physicas causas rerum coelestium [illegible] seu dibtatitia [illegible] circelli [illegible]



[illegible] physica [illegible] dicta [illegible] per [illegible] trianguli [illegible] physica [illegible] Mea igitur aequatio [illegible] RI aequalibus [illegible] BC [illegible] sic enim tuam corrige hypothesin. [illegible] aequa- [illegible]

[illegible]

[illegible], ipse [illegible] exprimat. Tua enim haec [illegible] est, cum una fidelia duo parietes dealbet. [illegible] [illegible] mea commenta super causis physicis [illegible] guli area ad tuas librationes traducam, [illegible] genuinam et rationalem propterea, quod [illegible] alienam, propterea quod area trianguli [illegible] tionem opticam? Non faciam, non enim hos [illegible] mihi potius, tuam hanc librationem [illegible] physicis res explorata est. Nam fateor [illegible] forma libratoria meam physicam, vidissemque [illegible] me nunquam in causas motuum incursurum [illegible] anime librationes easque videns consentire [illegible] suscipiat indagandum, quam causam hujus [illegible] deret? Quis non hinc sibi adamantinos [illegible] fortissimos AD et AΘ persuadeat? Quis [illegible] diversissima virtutibus magneticis? Itaque [illegible] qui mihi fuisset oriturus super miserrimo [illegible] quae non sunt in rerum natura, sed [illegible] eccentrici ejusque diametri [illegible] in [illegible] [illegible] impactam crebris ad latera [illegible] evellere. At [illegible] non [illegible] [illegible] et declinatus jam [illegible] [illegible], pro eo quo tibi [illegible] [illegible]? Vidi: pulchra est, at meretrix plurimis meis filiabus ex matre ph sica [illegible] hypothesis ad se lectores [illegible], [illegible] [illegible],

[illegible] Ptolemaicam formam, spirantes [illegible] nullis instructa vestibus hypothesium; tu ex [illegible] a me monstrata minus [illegible] vide- [illegible] peregrinam illi vestem induendi, quo minus [illegible] potius lectores inter membra et vestem hanc [illegible] inter equum et insessorem) non distinguerent, [illegible] Fabriciana vestis est: denique ut novo ornatu placeret [illegible] imo vero ut pro matura generosissima [illegible] ornatu et moribus ad [illegible] h. e. Fabricio interprete: ut arti conan- [illegible] philosophia. Sic igitur ipsa inventionis series arguit, [illegible] non naturalem.

[illegible] physica hypothesi vehementer abhorrueras, non [illegible] anomalia media quacunque ad veram compe- [illegible] anomaliam eccentri quantitate intermediam, a qua [illegible] hac tua non effugis, nisi cum majori damno [illegible]. Tu enim si librationem BC, h. e. aequationis [illegible] ad anomaliam mediam GH, nunquam [illegible] ab observationibus, ut fateris, variare eccentri- [illegible] hactenus emendavi tibi tuam hypothesin, [illegible] ED, quam ego appello eccentri. [illegible] in tuto meum haeresis, non quidem [illegible] quae in me cupiebas emendatum.

[illegible] quae maxime gloriari putas, tibi concedit [illegible] angulo BAC quaesita partem aequationis [illegible] ad partem opticam BHA investi- [illegible] duobus circulis administretur) duo [illegible] et moram in superioribus. Ego, tibi [illegible] partem physicam angulo AHB partem opticam [illegible] libratione planetae in linea recta a corpore [illegible] ipsi AB efficiens duo illa eadem, quae tu [illegible] mihi ad meam librationem non est opus [illegible] magnetica ipsius corporis Martii eaque [illegible] intelligentiis ad tuam librationem ad- [illegible] major incumbit quam mihi. Primum [illegible] distantia BC ad modulum justum [illegible] ut AB ad BC sic tota ad tangentem, [illegible] BAC. Mihi manet prima operatio, at [illegible] tangens) anguli EBD (?) multiplicatur

[illegible]

[illegible] captus facilitate longe intervallo [illegible] sequentes et [illegible] tamen [illegible] sufficientes [illegible] aequipolleat [illegible] physicas adeoque observatis [illegible] 9 menses, libenter [illegible] schemata erronea de [illegible] silentio: [illegible] intricatissima manu [illegible]

Valete. 10. Nov. 1608.

[illegible] hae sunt [illegible] literae Kepleri ad Fabricium [illegible] Fabricii ad Keplerum [illegible] exhibent hoc loco notanda.

Die 2/12. Oct. 1608. scripsit Fabricius, praemissis [illegible] : non puto te [illegible] objectiones [illegible] [illegible] suppositam ellipsin dari non posse [illegible] et forte in [illegible] demonstrasti. Noli igitur amplius [illegible] et calculare potius Ephemerides [illegible] sit [illegible] compendiis ex hypothesibus [illegible] observationibus [illegible] et latitudinis [illegible]

Mitte hypothesin Martis. Videbis observationes [illegible] tuo gratissimum erit. Tibi copia sit vel mutandi textum vel [illegible] disponendi, prout videbitur, saltem ut ipsa hypothesis salva maneat [illegible] [illegible] respondere.

[illegible] 1609 [illegible] hypothesis [illegible] Martis nova a D. Fabricio inventa [illegible] [illegible] hypothesis [illegible] fuere.

[illegible] CD [illegible]



[illegible]

[illegible] d. 12/22. Martii 1609 respondit ad praemissas Kepleri, „mi-[illegible]. In annali, inquit, otio tuo saepe miratus sum sesquiannale [illegible] in coelo, ♂ in solo. Res mira! Arte hactenus debellasti Martem, [illegible] et vinci pateris? Recte facis, qui recollectis viribus et redinte-[illegible] studes, et bellum non solum Marti sed toti coelo inferre et regnum [illegible] alteris. Fac, virum te praestes et Herculis clava obvios quosque [illegible] et nodes disjicias et dispellas et aditum nobis ad sacratissimum [illegible] tua perficias. In te animi totius Europae et omnium astronomorum [illegible] omnium es.

[illegible] aliquid in commune adferre posse, quod vero quam sit parum, et sentio [illegible] nescio quam lividi et minus liberalis animi notam innuere [illegible] tibi communicare nolim, quibus tamen te melius uti posse [illegible] ultimum, at primum egregie nego. Egone te in nonnullis aemulum [illegible], quem in omnibus ut praeceptorem veneror, ut Apollinem [illegible], cujus opera et consilio hactenus proficio? Nihil est in meis [illegible] tibi [illegible] impertiam.

[illegible] attinet, mirum quam me tua festivitate recreaveris et judicio [illegible] tuum amo et laudo, et ut tu innuis, ex tuis primum profeci [illegible] tua mihi intricata semper visa fuerit.

[illegible] hypothesi sua, addit Fabricius: Si igitur eam, prout illam hic [illegible] Commentariis in fine, veritatis tui calculi confirmandae gratia, addere [illegible]; sin minus, tibi soli serva, donec ipse occasionem publicandi

[illegible] non invenit; intacta conservavit Keplerus haec folia, quae [illegible] Kepleri manuscriptis tandem Petropolin migraverunt, unde ad [illegible] concessa ad hanc editionem.

[illegible] Keplerus adjungere noluerit operi suo, eo tempore, quo has [illegible], mentionem tamen honorificam facit amici sui „Uranici"

ASTRONOMIA NOVA

ΑΙΤΙΟΛΟΓΗΤΟΣ,

SEU

PHYSICA COELESTIS

tradita commentariis

[illegible]TIBUS STELLAE MARTIS

Ex observationibus G. V.

TYCHONIS BRAHE

[illegible] II [illegible]

[illegible] IMPERATORIS [illegible]

P. [illegible] Scholarum Mathematicarum lib. II. pag. 50.

Commentum igitur hypothesium absurdum est: sed tamen [illegible] Aristotele, Callippo simplicius, qui veras hypotheses arbitrati sunt: [illegible] ἀναστρεφ[illegible] orbium sunt venerati. At in posteris fabula est longe absur[illegible] rerum veritatem per falsas causas demonstrare. Quapropter logica [illegible] matica, arithmeticae et geometriae elementa ad amplissimae artis [illegible] [illegible] fuisset, astrologiam astrorum suorum veritati respondentem describere, [illegible] dam laboris instar Terram movere, ut ad Terrae motum quietas stellas [illegible] potius e tot nobilibus Germaniae scholis exoriare philosophus, idem et [illegible] qui positam in medio sempiternae laudis palmam assequare. Ac si [illegible] fructus tantae virtutis praemia proposita [illegible] professionis [illegible] formatae absque hypothesibus astrologiae tibi spondebo; sponsionem [illegible] tissime vel nostrae professionis cessione praestabo.

Auctor Ramo.

Commodum, Rame, vadimonium hoc deseruisti, vita [illegible] si tu nunc retineres, mihi quidem illam ego jure meo vindicarem [illegible] tua logica judice, pervincam. Tu modo subsidia rogans [illegible] mathematica, ne quaeso excluseris adjumenta physica, [illegible] Et ni fallor facilem te das: quippe qui conformatori tuo [illegible] sophiam circumjicis. Eadem igitur facilitate philosophiam [illegible] dignissimam, non giganteo conatu, [illegible] novum agit, nihil insolens, sed officio fungitur ob quod [illegible]

Fabula est absurdissima, fateor, naturalia per falsas [illegible] haec non est in Copernico: [illegible] minus quam illi tui veteres sunt [illegible] tantum de hoc Opus.

Vis tu vero scire [illegible] Osiander annotatum est in [illegible] igitur Andreas cum editioni Copernici [illegible] [illegible]

D. RUDOLPHO II.

[illegible] IMPERATORI SEMPER AUGUSTO,

[illegible], BOHEMIAE &c. REGI, ARCHIDUCI AUSTRIAE &c.

Augustissime Imperator.

[illegible]

in quem Luna ingressa est, ludere solet astragalis [illegible] in Leone, quo Sol utitur hospitio, familiariter notus est; Ille [illegible] est dominus, cui subesse creditur Germania, planeque [illegible] Sa Ca Mte Va habet imperium.

Hanc igitur triumphi partem illi licet occupent, nullam [illegible] die rixandi causam exhibebo: transeat haec licentia inter [illegible] Ipse ad astronomiam vertar, curruque triumphali inve[illegible] captivi nostri gloriam, mihi peculiariter notam, omnesque [illegible] confectique rationes expl[illegible]

Neque enim sine honore nobis est habendus, quem aete[illegible] Architectus, communisque siderum, hominumque [illegible] corporum aspectabilium locavit acie, ut perenni curriculo [illegible] theatro Creatoris sui militaret gloriae; hominumque [illegible] veterno criminosa ignaviae ignorantiaeque exprobratione [illegible] sionibus suis exerceret, inque coelum ad Conditoris sui lau[illegible] irritando pertraheret.

Hic est ille potentissimus inventionum humanarum Domi[illegible] [illegible] celebrem Copernici discipulum, [illegible] tum immitem patronum, importuni [illegible] tum protrubasse, addito responso: [illegible]

[illegible] omnia consilia detexit [illegible] peracta [illegible] ab [illegible] instructus ut in hanc curam [illegible] accessi, pri- [illegible] quem jam mediocriter cognoveram, deinde motatis di- [illegible] quibus ille ad pristina loca [illegible] [illegible] subtilibus instructas [illegible] direxi, omnemque locum indagine cinxi, curribus magnae [illegible] in gyrum circumactis.

[illegible] sine [illegible] successit negotium; dum frequenter ibi desunt [illegible] earum usus erat, aut dum viis lutosis, magno [illegible] impendio, transvectantur ab imperitis aurigis, [illegible] quarundam, mihi nondum exploratus, in diversa, quam [illegible]. Saepe splendor Solis aut Lunae, saepe coelum [illegible] oculis imposuit, saepius objectus aëris vapidi globum [illegible] deflexit, nec raro parietes, obliquissime objecti, ir- [illegible] quantumvis crebros. Accessit hostis in excursionibus [illegible] vigilantia, nobis plerumque dormientibus; in repugnando [illegible] qui expugnato aut prodito castello uno sese recepit ad [illegible] castellorum ratio expugnandi, nec iter ab uno [illegible], sed aut fluminibus interceptum, aut sentibus impedi- [illegible] vero incognitum: quae singula suis locis in hoc commen- [illegible].

[illegible] quod cladis, quod calamitatis genus non saeviit? [illegible], seditio, pestis, morbi, domestica negotia bona [illegible] comparata: novus et improvisus et [illegible], ut retuli in libro de Nova Stella; alio tempore [illegible] cauda, vomens ignes meaque castra infestans; [illegible] imperitia: et caput omnium, extrema [illegible]

[illegible] persistere vidit in proposito, se vero nuspiam [illegible], animum ad pacis consilia traduxit, [illegible] victoriae mihi confessionem obtulit; libertatemque [illegible] vincula, brevi post arithmetica et geometria stipan- [illegible] cum alacritate transivit.

[illegible] nostrae aequis ani- [illegible], quippe quietis insuetus, nobis [illegible] si forte perterrefacti ridendi copiam [illegible] nobiscum habitare serio con- [illegible] suam nobis approbavit.

[illegible] regionibus aethereis [illegible] Saturnus, Venus soror [illegible]

[illegible]

[illegible] ducibusque per hos novem annos in hac [illegible] [illegible]
peditavit) Ca Mtas Va aerarii praefectis imperet, ut de nervis [illegible]
[illegible] mihi pecuniam ad militem conscribendum [illegible]
sic ota, ut quae et a Mte Va jam [illegible] comprobata etiam [illegible]
Augustique Mtis Vae Nominis immortalitatem pertinere [illegible]
[illegible] meam operam devovi. Eique me jam subjiciens [illegible]
[illegible]
[illegible] in gyrum circum[illegible]

IV. Cal. Apr. anno aerae Dionysianae MDCIX.

Sae Cae Mtis Vae

[illegible]

EPIGRAMMATA

HAEC COMMENTARIA DE MOTIBUS MARTIS.

[illegible] AD KEPLERUM.

[illegible] Kepleride o Martem contemnere noster?
[illegible] nihil Mars, nisi se ipse sibi.
[illegible] vinclis illum submittere [illegible]
Qui liber [illegible] exstitit innumeris.
Sic Musa. At contra ad Musam sic ille: Quid ergo?
[illegible] tibi Palladis historia?
[illegible] Pallas potuit prosternere saxo
Gradivum: vestro si modo Homero canis:
Quanto igitur quoque nunc, magna [illegible] Minerva,
[illegible] Mars truculentus erit?
[illegible] Rudolphus omnia [illegible]
[illegible] quoque dura pati.

ALIUD.

[illegible] Martem [illegible] olim
[illegible] cum [illegible]
[illegible] vinclis [illegible] iisdem
[illegible] Veneris culpa, aut culpa Minervae aut
[illegible] Phoebi [illegible] Typho
[illegible] hic Martis cruribus inseruit.
[illegible]
[illegible] Keplerius [illegible]
[illegible]
[illegible] Keplerique [illegible]

[illegible] fuit Pragae an. 1609.

[illegible] f. Dresdae.

[illegible]

Ergo agite o juvenes, quibus est vigor [illegible]
Ingenii geniique favor, quibus inclyta ab orta
Uranie Divum coeli inspiravit amorem,
Et dedit aethereis [illegible] et [illegible] quaeque
Posthabuisse bonis: qui non temeraria vulgi
[illegible] voces [illegible]
Obscuris talpas mittentes degere in antris,
Perpetuo ut coecae maneant, velut esse cupiscunt:
Huc spirate [illegible] populo [illegible] terga relicto
Tendite; nec mentem, quae pars est enthea coeli,
Hoc patrio private bono; studium atque laborem
Huc ferte unanimes; fesso ut succurrere Regi
Alfonso liceat, pondus non viribus aequis
Qui modo vicini tulerat successor Atlantis;
Auxilium simul ut promtum Copernicus ingens
Sentiat; Herculeo ne, dum se inferre labori
Aggreditur fidens, oneri succumbat iniquo;
Sicque poli, Atlantis cassi Alcidaeque columnas
Ingentem, jam jam nutantes, ferre ruinam
Cogantur, Terramque simul statione moventes,
Barbariae hospitium (crassa ignorantia coeli
Quam pariet) cunctosque homines pecudesque ferasque
Turbantes casu ancipiti coecisque tenebris,
Antiquoque chao miscentes atria mundi.
Hoc prohibete [illegible]
Et mecum [illegible]
Viribus [illegible]
[illegible]
[illegible]

Ecquis [illegible]
Obryzum [illegible]
Conspicuum [illegible]
[illegible]
[illegible] quos continet orbis
Innumeris dabitur, qui tam sublimia caeli?
Ecquis et auctorem [illegible] vasta
Tot [illegible]
Signa [illegible]
[illegible]

Respondet auctor Operis.

O [illegible] genere, et celsis natalibus heros,
Cui [illegible] alios animi coelestis origo,
Et praeclara dedit factis et [illegible] cantu
Hortatusque novam morientibus addere vitam;
Quid [illegible] optatis et tanta incendia dudum
[illegible] animum flammis ventoque fatigas?
Nam quamvis tanta orsa, meas superantia vires,
Non alios poscunt, quam fert tua Musa, magistros,
[illegible] animo minus ingenioque lacertos
[illegible] mihi lege dedit natura: Sororum
[illegible] Deus coeli inspiravit amorem.

[illegible] amor, quid non mortalia pectora cogit?
Ille [illegible], validos dedit ille lacertos,
[illegible] animans. Sed enim Junonis iniquae
[illegible] studia [illegible] vulta
Teque et [illegible]. Tibi virtutis dedit ille colendae
Materiem, mihi [illegible] negat [illegible] eodem
[illegible] furtoque Promethei
[illegible] custodire [illegible] ignes.
[illegible] opibus te larga gravat, fulgore metalli
[illegible] socios, ut sint ad lumina segnes
[illegible] operi se jungere pompis,
[illegible] populari sibilus aurae;
[illegible] fert contemnta dolorem.
[illegible]
[illegible] Divinaque [illegible]
[illegible] rationis [illegible]
[illegible] probas, ausu constante secutus,
[illegible]
[illegible] privam socios accersere laudem,
[illegible]? Non [illegible], virtus
[illegible]

Miratus Brahaee [illegible] dulcemque [illegible],
Concepto quamvis nolles decedere sensu,
Multa super Terris dubitans, super [illegible] [illegible];
Me tamen in numerum placuit transcribere [illegible],
Mi noctes aperire [illegible] inventaque longi
Temporis; et claram coeptis [illegible] [illegible].

Vixissesque utinam, nec tanto [illegible] [illegible]
Praecupis, tam meritos rapuisset Parca [illegible].
Non alios visu et subtilibus instrumentis
Pandere sese orbes, magni penetralia coeli,
Expertus, quam quos firmant mea [illegible], [illegible].

Nunc quando properum, Divae, [illegible] [illegible];
Festivosque dies ornataque gaudia turbat
Subductus, quem debuerant [illegible], [illegible]:
Quid faciam? nisi [illegible] [illegible] [illegible] [illegible]
Artifici in vitam, o Heros [illegible], [illegible]
Astabis Magnus stellata in veste Sacerdos.
Hic ubi [illegible] [illegible] [illegible] [illegible]
[illegible] constructa Deo; [illegible] [illegible] [illegible]
Circumeunt, [illegible] rapida vertigine [illegible]
In medio [illegible] [illegible] [illegible] [illegible].

Accedo supplex, [illegible] haec [illegible] [illegible]
Scripta [illegible], rerum [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]
Te [illegible] [illegible], [illegible] [illegible] [illegible] [illegible]
Eja adole purus; [illegible] [illegible], [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible]
Annuat [illegible] [illegible], [illegible] [illegible]

Ejusdem Elegia [illegible]

[illegible]

De [illegible]

[illegible] globos septem septenae ex ordine mentes,
Quinqueque animae de patre Sole, vehunt:
[illegible]que vacat natura volutis,
Et pareunt novies, de grege, quinque Dei.
[illegible] Tycho [illegible] rationem, falle minutis:
Quas, nisi Tu, numeret nemo; ea cuncta ruent.
O curas hominum, o quantum est in rebus inane!
Quondam non alia si itur ad astra via.

[illegible] epigramma de studiis Tychonis Brahei.

[illegible] Tycho descripsit Solisque meatus;
[illegible] [illegible] [illegible]it, et occubuit.
[illegible] dolet [illegible];
Nil [illegible] sollers haec tibi cura Tycho:
[illegible] Endymion Trivia obdormivit amata;
[illegible] Triviae te quoque sopit Amor.

Introductio in hoc opus

Durissima est hodie conditio scribendi libros mathematicos [illegible] astronomicos. Nisi enim servaveris genuinam subtilitatem propositionum, demonstrationum, conclusionum, liber non erit mathematicus; [illegible] servaveris, lectio efficitur morosissima, praesertim in Latina lingua, [illegible] culis et illa gratia, quam habet Graeca, cum per signa literarum [illegible] que hodie perquam pauci sunt lectores idonei: ceteri in communi [illegible]

[illegible]

[illegible] recentiorum, concesso motu Telluris, detegam, in [illegible] capitum, quae ad hoc negotium faciunt, et sistam [illegible] principia, quibus conclusiones meae, tantopere [illegible]

[illegible] fideliter propositum, optionem postea liberam habebunt [illegible] demonstrationes ipsas labore maximo, vel mihi pro[illegible] adhibita sincera et geometrica methodo credendi: ipsi [illegible] partium, ad haec sic ob oculos collocata demonstrationum [illegible] certi, nisi iis eversis non ruituram demonstrationem [illegible] etiam tunc, ubi more physicorum necessariis admis[illegible] iis sic mixtis probabilem exstruxero conclusionem. Nam [illegible] coelestem astronomiae permiscui, nemo mirari debet, [illegible] adhibere. Haec enim physicae, haec medicinae, haec [illegible] est, quae praeter oculorum certissimas indicationes alia

[illegible] duas esse astronomorum sectas: alteram coryphaeo [illegible] allegatione veterum insignem: alteram recentioribus [illegible] quarum illa errantium stellarum singulas separatim [illegible] singulis in suis ipsarum orbibus assignat, haec planetas [illegible] in eorum motibus deprehenduntur communia, ex eodem [illegible] haec secta rursum subdividitur. Causam enim, quae [illegible] retrogradosque, Copernicus cum antiquissimo [illegible] Telluris domicilii nostri, quibus et ego sub[illegible] causam illam transcribit Soli, in cujus vicinia sit [illegible] (non tam corporeo, sed quantitative tamen) omnium [illegible] circulos: atque hunc velut nodum una cum Solari [illegible]

[illegible] singulis quidem adhaerent alia, nequulla [illegible] sed illa singulatim particularis [illegible] et mutari possunt, ut ipsae tres [illegible] in effectu ad unguem aequipolleant

[illegible] est astronomicum doc[illegible] in omnibus [illegible] quidem [illegible]

[illegible]

quantum Ptolemaeo centrum orbis Solaris abest a Terra, [illegible] eadem aut parallelis.

Objici vero mihi potuit a Braheanis, me temere [illegible] enim, cum veterum receptae opinioni insisterent et concursu[illegible] Sole, sed proxime Solem statuerent, tamen calculum inde [illegible] respondeat. Et in trajectione numerorum Brahеanorum in [illegible] dicere mihi potuit Ptolemaeus, sibi, dum observata teneat [illegible] non alium eccentricum quam illum, qui describatur a centro [illegible] epicyclus incedit aequaliter. Itaque debere me etiam aeque [illegible] agam: ne novo usus ratione id non praestem, quod ab illis [illegible] ratione veteri.

Huic igitur objectioni ut occurreretur, demonstratum est [illegible] per hanc novam rationem eadem plane fieri seu praestari [illegible] veterum rationem sunt praestita.

Secunda vero operis parte rem ipsam sum aggressus, et [illegible] rectius expressi per meam rationem loca Martis in apparenti Sole [illegible] illi expresserant per veterem rationem loca Martis in medio Sole [illegible]

Interim tota parte secunda (quantum ad geometricas demonstrationes [illegible] vationibus) in suspenso reliqui, uter rectius faciat. [illegible] observationes [illegible] regulam nostris [illegible] [illegible], physicis vero causis consentaneam esse [illegible] [illegible] veterem, partim ostendi parte prima, praecipue [illegible]

At [illegible] parte [illegible] operis Capite LII. per [illegible] non minus [illegible], quam priores erant, [illegible] [illegible] pulcherrime demonstravi [illegible] [illegible] esse, ut ipsum Solaris corporis centrum in linea [illegible] vero aliquod punctum prope; itaque eccentricos [illegible]

[illegible]

[illegible] in illis diametris epicyclorum, quae a Capricorno in Can[illegible] esse puncta aequalibus intervallis extrema, hinc a mediis [illegible] minimo vero intervallis tantis, in proportione ad diametros, [illegible] tota, collatione facta ad sui circuitus diametrum; ex [illegible] loco media, illa esse epicyclorum quorum centra, quae [illegible] sint, esse puncta, circa quae motus epicyclorum sint [illegible] hinc versus Capricornum sint, illa esse, quorum eccen[illegible] indagamus, si pro medio Solis motu apparentem [illegible] in punctis epicycli ad eccentricum affixi sint, ut ita in [illegible] sit absolute tota Theoria Solis cum omnibus ejus [illegible]tatibus.

[illegible] infallibili methodo, jam et prior gradus ad causas phy[illegible] ad eas gradus exstructus, in Copernici et Brahei [illegible] Ptolemaica obscurius et probabiliter saltem.

[illegible]eatur sive Sol, demonstratum certe est, id corpus quod [illegible] ratione, tarde scilicet, cum longius abest a quiescente; [illegible] proxime accessit.

[illegible] appares discrimen opinionum trium in physica; per conjec[illegible] cedentes certitudine conjecturis medicorum de usu partium [illegible] physicis.

[illegible] Ptolemaeus exploditur. Quis enim credat, totidem esse [illegible] similes inter se, imo vero et aequales) quot planetae [illegible] omnia sufficere unicam theoriam Solis, axioma quippe [illegible] naturam paucissimis uti quam possibile est.

[illegible] Braheo potiorem esse in physica coelesti [illegible] multis [illegible]

[illegible] theorias illas Solis quinque e planetarum theoriis sustulit [illegible] deduxit, occultavit, in unam conflavit, rem ipsam [illegible] reliquis in mundo. Planeta enim quilibet [illegible] Braheo non minus quam Ptolemaeo [illegible] Solis, miscens utrosque in unum, ex qua mixtura [illegible]

per hoc maxime fit verisimile, quia in eo fons est motus [illegible] netarum. Sive enim Copernicum sequaris sive Brahe[illegible] est fons motus planetarum quinque, in Copernico etiam [illegible] Fontem autem omnis motus verisimilius est suo loco manere [illegible]

At si Brahei opinionem sequamur, et Solem dicamus [illegible] hoc demonstratum, Solem tardum incedere cum a Terra [illegible] appropinquat, idque non ad visum tantum, sed etiam in [illegible] effectus aequantis circuli, quem per demonstrationem nec[illegible] Solis inquixeram.

Super hac igitur certissima conclusione per conjecturam [illegible] patam extruendum esset hoc physicum philosophema, Solem [illegible] maximoque quinque eccentricorum onere (ut crasse loquar) [illegible] fontem motus Solis et affixorum Soli quinque eccentricorum [illegible]

Atqui corpora utraque Solis et Telluris inspiciantur [illegible] que, cui magis competat fons motus corporis reliqui. Sol [illegible] ceteros movet planetas, an Terra Solem, motorem ceterorum, [illegible] Ne igitur cogamur concedere, Solem a Terra moveri, quod [illegible] bilius, Telluri motus est concedendus.

Quid dicam de tempore periodico motus dierum 365, [illegible] intermedium inter periodicum tempus Martis dierum 687 [illegible] [illegible] rerum natura, circuitum, in quo [illegible] 365, esse etiam medium esse inter circuitus Martis et V[illegible] [illegible] quoque circa Solem, Terrae igitur esse hunc circuitum [illegible] circa Terram? [illegible] magis propria [illegible] [illegible] argumenta, quam [illegible]

Igitur cetera metaphysica argumenta, quae pro Sole [illegible] [illegible]

[illegible] petit Terram.

[illegible] mundi [illegible] centrum [illegible] magis virtutem [illegible] extra [illegible] retinerentur [illegible] Terra [illegible] Luna [illegible]

[illegible]

Episcopus Arabiae et Taprobanae utique vicinae, non vero [illegible] (imo vero per anfractus illi aetati noti [illegible] amplius [illegible]. Quae vero hodie Taprobana putatur Sumatra insula, [illegible] isthmo Indiae conjunctam, ad urbem Ma[illegible] quam hodie credimus auream, non multo magis Cherson[illegible] quam Italia. [29])

Quae quamvis erant alius loci, sic uno contextu explic[illegible] aestu marino et per hunc virtuti Lunae tractoriae [illegible].

Sequitur enim, si virtus tractoria Lunae porrigitur in [illegible] magis virtutem tractoriam Telluris porrigi in Lunam et [illegible] nihil certum, quod ex terrena materia quomodocunque [illegible] vehitur, complexum hunc fortissimum virtutis tractoriae [illegible]

Leve vero nihil est absolute, quod corporea materia [illegible] levius est, quod rarius est sive natura sua, sive ex accid[illegible] dico non illud tantum, quod porosum est, et in multas [illegible] genere, quod sub eadem loci amplitudine, quam occupat [illegible] quantitatem materiae corporeae concludit.

Levium definitionem sequitur et motus. Non enim est [illegible] ad superficiem usque mundi, dum feruntur, sursum aut [illegible] quia attrahuntur quam gravia, et sic expelluntur a gravibus [illegible] retinenturque a Terra loco suo.

[illegible] virtus tractoria Terrae, ut dictum, [illegible] tamen si lapis aliquis tanto intervallo abesset, quod [illegible]

[illegible]

[illegible] et prodigiosam celeritatem [illegible] coeli [illegible], si [illegible] plane immobilis.

[illegible] illorum, qui pictate moventur, [illegible] adcoptantur [illegible] Spiritui Sancto in Scripturis loquenti [illegible] [illegible] dexerimus.

[illegible], cum oculorum sensu plurima et potissima addiscamus, [illegible] sermonem nostrum ab hoc oculorum sensu abstrahemus, [illegible] ubi cum oculorum sensu loquimur, etsi certo scimus, [illegible]. Exemplum est in illo versu Virgilii: provehimur portu, [illegible]. Sic cum ex angustiis vallis alicujus [illegible] [illegible] aperire dicimus. Sic Christus Petro: Duc in altum; [illegible] litoribus. Sic enim apparet oculis, et optici causas demon- [illegible] [illegible] sermone utitur receptissimo, qui tamen ex hac [illegible]. Sic ortum et occasum siderum, hoc est ascensum et [illegible] eodem tempore Solem alii dicant descendere, quo nos [illegible]. Vide Opticae Astronomiae Cap. X. fol. 327. (II. 325.) Sic [illegible] dicunt Ptolemaici, quando per aliquot continuos dies apud [illegible], etsi putent ipsos tunc et vera moveri deorsum in linea [illegible], [illegible] solstitium dicit omnis scriptorum natio: etsi negent [illegible] quisquam adeo deditus erit Copernico, quin Solem [illegible] vel Leonem, etsi innuere vult, Terram ingredi Capri- [illegible] ceterae similiter.

[illegible] literae de rebus vulgaribus (in quibus illorum institutum [illegible]) loquuntur cum hominibus humano more, ut ab hominibus [illegible] quae sunt apud homines in confesso, ad insinuanda alia [illegible]

[illegible] loquatur humanis, tamen [illegible] seu scientibus hominibus seu ignaris. Quis [illegible] Psalmo XIX. [illegible] sub imagine Solis [illegible]

[illegible]

Josuae [illegible] hac [illegible], ut hoc sic [illegible] [illegible] quippe hoc videri vanum et [illegible] [illegible]

Sol vide Caput X. [illegible] pars opticae [illegible] omnibus hominibus Sol moveri videtur, non vero Terra [illegible] appareat, Terra vero magna; neque Solis motus comprehen[illegible] tatur apparenter, sed ratiocinatione solum, ob [illegible] propinquitatem ad montes. Impossibile igitur est, ut [illegible] aliud imaginetur, quam Tellurem cum imposito coeli fornice [illegible] domum, in qua immobili Sol tam parva specie, instar volucris [illegible] ab una plaga in aliam transeat. Quae adeo imaginatio [illegible] lineam dedit in sacra pagina. Initio, inquit Moses, creavit Deus [illegible] quia videlicet hae duae partes potiores occurrunt contemplanti [illegible] Moses homini: Totum hoc aedificium [illegible] quod vides, [illegible] latissimeque porrectum infra, cui insistis et quo tegeris, [illegible]

Alibi quaeritur ex homine, num pervestigare noverit [illegible] et profunditatem terrae deorsum: quia scilicet vulgo hominibus aeque infinita excurrere spatia. Neque tamen exstitit, qui [illegible] hominum diligentiam seu in determinanda Telluris [illegible] comparatione, seu in pervestigandis astronomicis intervallis, [illegible] scriberet, cum non loquatur de ratiocinatoria dimensione, sed de corpori terreno affixo [illegible] totum Jobi caput XXXVIII, et compara cum iis, quae [illegible] [illegible] disputantur.

[illegible] ex Psalmo [illegible] novum aliquod philosophiae [illegible] nibus; nonne hoc illi recte diceretur, [illegible] [illegible]

sentias, se non minorem Deo cultum praestare, quam astronomum [illegible]
dedit, ut mentis oculo perspicacius videat, quaeque invenit, [illegible]
et ipse celebrare possit et velit.

Quo nomine mediocriter, non parum sane, doctis commendo [illegible]
Brahei de forma mundi: quippe quae mediam quodammodo [illegible]
parte astronomos, quoad ejus fieri potest, inutili [illegible]
liberat, causas motuum, ignoratas Ptolemaeo, cum Copernico [illegible]
speculationibus aliquem locum dat, Sole in centrum systematis [illegible]
ex altera vero parte vulgo literatorum servit, motumque [illegible]
difficilem eliminat: licet per eam theoriae planetarum in [illegible]
nibus et demonstrationibus multis intricentur difficultatibus [illegible]
physica coelestis.

Atque haec de sacrarum literarum auctoritate. Ad [illegible]
de his naturalibus uno verbo respondeo: in theologia [illegible]
philosophia vero rationum esse momenta ponderanda. [illegible]
qui Terram negavit esse rotundam; sanctus Augustinus, [illegible]
negavit tamen antipodas; sanctum Officium hodiernorum, [illegible]
esse, negat tamen ejus motum. At magis mihi sancta [illegible]
rotundam, et antipodibus circumhabitatam et contemptibilem [illegible]
denique per sidera ferri, salva doctorum ecclesiae [illegible]

Sed satis de hypotheseos Copernicanae veritate. [illegible]
tamen, a quo feceram initium hujus introductionis. [illegible]
[illegible]

[illegible] aedificio fastigium hoc fuit impositum et demonstratum geome-[illegible] hujusmodi effici solere a magnetica corporea facultate. Itaque [illegible] proprii probabilissime ostensi sunt nihil aliud esse, quam [illegible] planetariorum corporum tales, qualis est in magnete poli [illegible] rapiens: ut ita tota ratio motuum coelestium facultatibus mere [illegible] magneticis, administretur, excepta sola turbinatione corporis [illegible] permanentis, cui vitali facultate opus esse videtur. Nam [illegible]stratum, nostras jam introductas hypotheses physicas etiam [illegible]. Datum tamen fuit aliquid partibus III. et IV. etiam [illegible] proprius cum animali facultate movendi sui globi con-[illegible] quis objectionibus nonnullis [illegible] ad speciem validis [illegible] diffidere velit: modo talis aliquis hoc recipiat, mentem [illegible] diametro Solis pro mensura librationis, sensumque habere angu-[illegible] [illegible]nemi.

[illegible] physicorum dictum esto; cetera invenient astronomi [illegible] ordine ex sequentibus singulorum capitum argumentis, [illegible] velut, cum ut essent loco indicis; tum ut lector [illegible] sive materiae seu styli, secundum Tabulam synop-[illegible] argumentis aliquam lucem petat rationemque ordinis et [illegible] caput congestarum, si minus fortassis in ipso contextu [illegible] evidentius inter argumenta in paragraphos suos secta. [illegible] rogo.

SYNOPSIS TOTIUS OPERIS.

PARS PRIMA.

Medio

Apparente

Cap. VI.

PARS SECUNDA.

[illegible] QUARTA.

[illegible], quae [illegible]. Cap. XLII.

[illegible] quae [illegible] discrepare. Cap. XLIII.

[illegible]. Cap. XLIV.

[illegible]. Cap. XLV.

[illegible], seu figurae decursae. Cap. XLVI.

Effectus et circuitus — Areae intra orbitam. Cap. XLVII.

Orbitae circa [illegible]. Cap. XLVIII.

Efficientium principiorum. Cap. XLIX.

[illegible] per inductionem sex nodorum [illegible]. Cap. L.

Aequationes, de quibus [illegible] cap. quinque.

Plures inquiruntur in selectioribus locis — Eccentrici gemellae comparet — In unum praecentem. Cap. LI.

Ad stabiliendum Solis apparentem motum. Cap. LII.

Epicycli seu orbis annui. Cap. LIII.

Comparantur [illegible] diametro eccentrici. Cap. LIV.

[illegible]. Cap. LV.

[illegible], quales, quanti sint. Cap. LVI.

[illegible], [illegible] motibus, ostensa [illegible] motus. Cap. LVII.

[illegible]. Cap. LVIII.

Per [illegible] et distantiarum in unam hypothesin. Cap. LIX.

[illegible]. Cap. LX.

PARS QUINTA.

Prima: ejus — [illegible] — Principii seu loci Nodorum. Cap. LXI.

Termini seu limitum inclinationis maximae. Cap. LXII.

[illegible] Physicae. Cap. LXIII.

Secunda, seu maxima latitudo in conjunctione et oppositione cum Sole. Cap. LXV.

Latitudinis, cujus consideratio est composita temporum

Praecedentium tantum et simplex, seque vel etiam praeteritorum, et mixta cum aliis nonnullis. Quaeritur enim in inaequalitate

Propter quam [illegible] plicantur inaequalitates

Permixtae invicem, ubi scilicet contingat latitudo omnium maxima. Cap. LXVI.

Ad confirmandam hactenus extructae Theoriae — Formam, quod ejus fundamentum sit Sol ipse, non punctum ejus vicarium. Cap. LXVII.

Proportionem ad diametrum Telluris, seu parallaxeon examen. Cap. LXIV.

Prima, — Planorum inclinatio. Simul de ecliptica locomotione, et inaequali motu nodorum aequinoctiorumque. Cap. LXVIII.

Motus medius nodorum, simul aphelii et eccentrici. Cap. LXIX.

Secunda, latitudo omnium maxima. Simul orbium proportio, et mutatio eccentricitatis Solis. Cap. LXX.

ARGUMENTA SINGULORUM CAPITU[illegible]

Cum alia sit methodus, quam natura rei docet, alia, quam [illegible] utraque artificialis: neutram a me lector sinceram exspectare [illegible] [illegible] hic praecipuus est, explicare motus coelestium, quod fit in [illegible] [illegible]: neque tantum docere [illegible] et [illegible] a primis [illegible] quam viam Ptolemaeus et plurimum observavit: sed accedit [illegible] [illegible] oratoribus, ut quia nova multis [illegible], id sanctus [illegible] [illegible] et [illegible] lectoris et [illegible] suspicionem [illegible]

Nil igitur [illegible] methodis [illegible] admiscendam [illegible] hoc est historicam [illegible] inventionum, ubi non de [illegible] cogitationum [illegible] via compendiosissima [illegible] de [illegible] [illegible] auctor [illegible] argumentis seu [illegible] seu fortuitis [illegible] [illegible] Quodsi Christophoro Columbo, si Magellano, si [illegible] [illegible] narrationibus, quibus ille Americam, [illegible] [illegible]; sed ne velitis [illegible] [illegible] [illegible] mihi vitio vertatur, quod [illegible] eodem lectoris [illegible]. Nam [illegible] Astronomorum [illegible] [illegible]

Dedi [illegible]

[illegible] apparenti [illegible], hoc est si visus, imo potius si fons virtutis [illegible] in alium locum. [illegible]

[illegible] V. sic se habet ad IV, ut III ad II. Negotium enim magis [illegible]

[illegible]

PARS II.

Cap. VII. Particularius explico occasiones et [illegible] et quae me permoverint, apparentem Solis motum [illegible] hoc modo praemittere. [illegible]

Cap. VIII. Exhibet hypothesin primae inaequalitatis [illegible] constitutam, eamque in tabula, quae habet fundamenta, scilicet [illegible] effectum, computatos scilicet locos juxta observatos [illegible] appareret an haec hypothesis [illegible]

Cap. IX. [illegible] pro loco planetae in suo proprio circulo [illegible] ecliptica. 2) [illegible] tabula sequitur [illegible] visum [illegible] eclipticam pertingentium. 3) [illegible] in locum visum sed in locum verum orbitae [illegible]. (4) [illegible] cendi per visae latitudinis angulum, et astruitur modus reducendi per [illegible] planetarum.

Cap. X. [illegible]

Cap. XI. [illegible]

Cap. XII. [illegible]

Cap. XIII. [illegible]

[illegible] hypothesis [illegible] in motu longitudinis [illegible] in motu latitudinis circa [illegible] atque Brahaeana [illegible] hic [illegible] idque [illegible] 2) [illegible] hypothesium Ptolemaicae et Brahaeanae [illegible] in eo esse, quod non fuerit bisecta eccentricitas. [illegible] hypotheses [illegible] in longitudinis motu. Ex [illegible] diligentius super his rebus [illegible] per motum latitudinis circa Solis oppositum, sic nunc [illegible] Solis [illegible] convincetur haec mea hypothesis [illegible] Solis motui [illegible] 3) Demonstratio applicatur etiam formae [illegible] 4) [illegible] ad fontes [illegible] et ad cor- [illegible] interjicitur, quales lineae in plano eclipticae sint sub- [illegible] a Sole in plano eccentrici planetae, quando planeta [illegible] eccentricis [illegible] ut falsa hypothesis verum pro- [illegible] fieri possit.

[illegible] in qua veteres sum imitatus.

PARS III.

[illegible]

Cap. XXX. Distantiae Solis et Terrae [illegible]
pendi, qui ubi ostenditur [illegible]
ideoque provocat juste ad sequentia capita XXXI [illegible]
non tamen sensibiliter abire [illegible]

Cap. XXXI. Metuebat [illegible] Solis [illegible]
Solis turbarem. Hic ergo metus tollitur [illegible]
per bisectam seu per duplicationem ejus quod [illegible]
eandem in Sole prodire aequationem. Alius igitur [illegible]
cap. XXXI. Ibi metuebatur [illegible]
motus est figura [illegible] eccentricitatis ratio. [illegible]
pria hujus loci.

Cap. XXXII. [illegible]
bisectione eccentricitatis [illegible]

Super hoc principium geometrica demonstratione [illegible]
netae in aequalibus arcubus eccentri proportionari [illegible]
constringit eccentricitas. Arrigite aures physici, [illegible]
in vestram provinciam facienda.

Cap. XXXIII. Jam enim ex conclusione [illegible]
axiomatibus mere physicis et confessis evincitur, [illegible]
tatur eccentricitas esse causas dispensatricea [illegible]

[illegible]

[illegible] ad explicationem ejus peculiaris virtutis, [illegible]
[illegible] planetas singulos singulis [illegible] motus suos, [illegible] duobus [illegible] a motu [illegible]
[illegible] animalis seu physica, necessaria ad inquisitionem [illegible] Requirit autem una [illegible] hoc capite [illegible] planetae, orbitam ordinari in perfecto circulo; [illegible] Disputatur igitur, quomodo [illegible] primo demonstratur id fieri posse, si propria planetae [illegible] corpus suum [illegible] etiam a [illegible] physica. Secundo demonstratur, id [illegible] certum punctum extra Solem, a quo aequaliter distet in omni [illegible]
Verum et haec certi puncti incorporei observatio [illegible] tribus [illegible] perfectum circulum, si virtus planetae propria [illegible] Solem [illegible] lege [illegible] praescripta, tanquam [illegible] non posse [illegible] justas librationes [illegible] diametro, sed nec respondere illas arcubus [illegible] [illegible] quod ex [illegible] Quare [illegible] etiam hoc [illegible] vim planetae propriam [illegible] eccentricum vel epicyclum [illegible] [illegible] Quantisper igitur [illegible] in dubio ad quam [illegible] planetae [illegible] librationis hujus [illegible] [illegible] planetae posse hanc [illegible] et librationem [illegible] diameter sive [illegible] [illegible] medio [illegible] Ubi astruitur, mentem [illegible] argumento [illegible] Respondetur etiam ad [illegible] [illegible] animal [illegible] difficultatibus [illegible] [illegible] hujus motus) in simplum [illegible] [illegible] cap. XLIX.
[illegible] planetae [illegible] Sole [illegible] est [illegible] a Sole [illegible]
[illegible]

[illegible] eccentrici certissime (licet non omnino subtilissime) constituta [illegible] dimidiam esse [illegible] speculationes praecipue [illegible] cap. [illegible]

Cap. XLIII. Ponitur fundamenti loco quod [illegible] eccentricitates esse inter se in proportione dupla. [illegible] in circulo perfecto. Ponitur tertio, quod cap. [illegible] aequalibus orbitae arcubus esse in proportione [illegible] aequationes elicituntur [illegible] falsitas. [illegible] quae non habeat aequalem [illegible] geometrae [illegible] Sic igitur constat falsae [illegible]

Cap. XLIV. Duobus argumentis demonstratur [illegible] sed ovalem figuram. [illegible]

In primo praesupponuntur demonstrata capitis XL [illegible] perfectum circulum [illegible] cap. [illegible] observationes [illegible] igitur [illegible] in epicycli diametro, sed [illegible]

In secundo argumento praesupponitur: [illegible]

[illegible]

Cap. XLV. [illegible]

[illegible]

[illegible] ipsum [illegible] iri ab observationibus. [illegible]
in eccentrici ovalis diametro longiore, punctum igitur [illegible]
[illegible] eccentricum, esse extra illam longiorem diametrum [illegible]
ut eccentrici ovalis alia sit linea [illegible], quam longior ovalis [illegible]
dum non punctum Solem transire, et sic [illegible]
Solis concurrere, non in puncto aliquo [illegible]

Cap. LIII. [illegible] methodus inquirendi [illegible]
[illegible] cum Sole: et simul demonstratio puncti orbis [illegible]
[illegible] appareat [illegible]. Ubi praesupponitur [illegible]
[illegible] et distantiarum utriusque a Sole [illegible]
Cap. LI [illegible] hypotheseos vicariae. [illegible]

Cap. LIV. [illegible]
stituitur et attemperatur proportio eccentricitatis et [illegible]

Cap. LV. Tandem reditur in viam, unde [illegible]
enim [illegible] demonstratur, [illegible] capite XLIV [illegible]
capitis XLV [illegible]
ubi comparantur observatio et cap. LI. LIII. [illegible]
[illegible] capitis LIV [illegible]
Et [illegible]
Nam aequationes in circulo computatae cap. XLIII. [illegible]
ovali cap. XLV. [illegible] per cap. XLVI. XLVII. [illegible]
[illegible]

Cap. LVI. Hinc jam demonstratur, distantias non [illegible]
[illegible]

Cap. LVII. [illegible]

PARS V.

Cap. LXI. Hypothesi longitudinis inventa, jam [illegible] loca [illegible] nodorum.

Cap. LXII. 1) Distantiis inventis [illegible] observationes acronychias; idque in utroque semicirculo. 2) [illegible] ad inclinationem cujusque loci conversa [illegible] 3) Tabella [illegible] latitudinum in opposito Solis, cum [illegible]

Cap. LXIII. 1) Traditur physica causa [illegible] 3) Disputatur [illegible] 4) Disputatur [illegible] 5) Positis orbitae [illegible] plana, et [illegible]

Cap. LXIV. [illegible]

Cap. LXV. 1) [illegible]

[illegible]

IN NOMINE DOMINI.

COMMENTARIORUM DE MOTIBUS STELLAE MARTIS

PARS PRIMA.

DE COMPARATIONE HYPOTHESIUM.

Caput I.

[illegible]

F] primae ad occasum veniunt [ut H per LK rursum [illegible]
Solem [in ABE], ut qui postridie in E existens, fixas [illegible]
quatur, quibus pridie junctus erat per HA: hoc iterum [illegible]
que siderum tardissimam Lunam; quia cum hodie cum [illegible]
F] occubuisset, postridie [coelo toto et una ipsa per F [illegible]
voluta] Solem occumbentem [in E] satis magno interval[illegible]
Hinc Pythagoraei, cum inter sidera musicos sonos distribu[illegible]
Lunae tribuere, et inter lyrae chordas [illegible] propter[illegible]
motus tardissimus esset. Hinc ortae voces [illegible]
rum [illegible]
veniebat (ut E Sol respectu G Lunae dicebatur [illegible]
stellae tardiori in primo motu [ut hic Lunae], quasi de[illegible]
linqueretur [in G] a celerioribus [E, D], de quibus [illegible]
nostrae Optices.

Hanc primam astronomiae adumbrationem, quae [illegible]
catione, sola vero et tardissima oculorum experientia [illegible]
schematibus nec numeris explicari [illegible]
cum perpetuo a se ipsa dissideat, [illegible]
aequetur, nulla ejusdem quantitatis nexu in vicinam [illegible]

[illegible]

[illegible] tamen observationum, [illegible] oculis [illegible] valde celer esset, [illegible] sic haec [illegible] in minutas partes dissecta, per plurimos dies [illegible] spargebatur. Jam vero sublata illa minuta [illegible] propriorum stellae motuum in dies jam multos [illegible] motu diurno, toti motus stellarum proprii, quanti fuerunt, [illegible] manifestius enituit. Primum enim apparuit, tres [illegible] Jovem et Martem motus suos ad Solis propinquitatem [illegible] ad ipsos accedebat, directi incedebant et [illegible] [illegible] opposita veniebat, ipsi [illegible] [illegible] intermediis temporibus stationarii [illegible], in quibuscunque zodiaci signis planetae [illegible] [illegible] ad [illegible] planetae [illegible] [illegible] directi et veloces [illegible] [illegible] Sole [illegible] [illegible] contraria signa [illegible] [illegible] signa zodiaci [illegible] ordine, qui ab [illegible] in orientalem [illegible] ut quod jam [illegible] in Ariete, post in Tauro et sic [illegible]

[illegible]



[illegible]

his, eccentricis omnibus in orbe uno Solis circumductis [illegible] ... ipsa utergue reliquit. Copernicus uno motu annuo [illegible] omnes [illegible] hisce perplexissimis [illegible] spoliat, planetas [illegible] orbitas quam proxime circulares [illegible] ... [illegible] tempori spatio totas percurrit, quot [illegible] ... centrum, una plus, puta novies, dum interim Tellus [illegible] [illegible]

Rursum autem animadversum est, hos [illegible] ... [illegible] in diversis zodiaci signis esse inaequales; ut, [illegible] ... [illegible] zodiaci retrocederet, alicubi per breviorem [illegible] ... jam breviore temporis spatio; seu idem perpetuo retrograd[illegible] ... [illegible] quodsi tempora et loca inter medios [illegible] ... computarentur, neque tempora temporibus neque arcus [illegible] ... [illegible] quaeque temporis suis arcubus eadem proportione [illegible] ... tamen [illegible] planetae certum signum zodiaci, [illegible] ... oppositum per utrumque semicirculum, [illegible] ... Ex quibus observationibus intellectum est, [illegible] ... [illegible] planetae in [illegible], quam [illegible] ... [illegible] idem zodiaci signum, altera cum [illegible] ... [illegible] itaque inaequalitatum causas et [illegible] ... potuerunt, nisi separarentur [illegible] inaequalitates [illegible] ... [illegible]erentur. Censuerunt igitur, ab inaequalitate prima [illegible] ... [illegible]

[illegible]

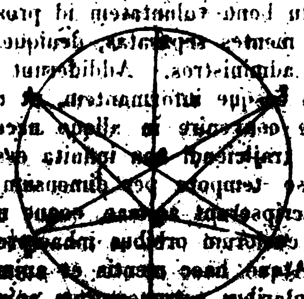
[illegible] planetae orbitam in aethere
[illegible] ex celebrioribus opinionibus de mundo sequuntur.
[illegible] hypothesium [illegible] hic in-

Caput II.

[illegible] aequipollentia eccentrici et concentrepicycli, et eorum causis physicis.

[illegible] illam a Ptolemaeo lib. III. et Copernico lib. III [illegible] aequipollentia hypothesium, quas [illegible] eccentricus paris facit cum epicycli [illegible] in eccentro et linea per centrum [illegible] perpetuo maneant paralleli; et hic [illegible] eccentrici [illegible]; [illegible] in eccentro [illegible] temporibus aequales arcus conficit.

Fig. 44.



et [illegible] quidem explicandum ex Purbachio [illegible] alter etiam ex Tychone. [illegible]

Ptolemaeus [illegible] nobis [illegible] [illegible] observatis applicata indicat. Purbachius modum [illegible] rentur, secutus Aristotelem, qui hoc idem in Eudoxi et [illegible] suppositiones, quibus astronomiam tradiderant, [illegible] auctores illi orbes 25 adhiberent ad demonstrandam [illegible] inaequalitatem, Aristoteles, solidis orbibus coelum [illegible] 24 revolventes censuit interponendos; [illegible] scilicet inferior [illegible] [illegible], quem propter contiguitatem superficierum erat [illegible] liberaretur. Igitur, cum in universum orbes [illegible] (sive [illegible] 53 aut 55) accumulasset, singulis singulos motores [illegible] [illegible] [illegible] et omnibus inferioribus, [illegible] [illegible] in orbe superiore [illegible] [illegible] quendam, [illegible] et a quo et plaga [illegible] [illegible] celeritati, qua esset orbis [illegible] [illegible] [illegible] processerat. [illegible] [illegible] [illegible] motores quoque [illegible] [illegible] [illegible] [illegible] capax [illegible] et principia [illegible], [illegible] aeternitate mundum exstruxisset aeternum, essetque [illegible] totius mundi bonitas et perfectio, opposita interitui [illegible] cipiis illis perfectionem summam tribuit, ejusque [illegible] tellectu bono voluntatem id prosequendi, ne [illegible] pacto mentes separatas, denique deos nobis [illegible] [illegible] administros. Addiderunt et animam [illegible] [illegible] [illegible] informantem, [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] infinita esset, uti [illegible] [illegible] tempore [illegible] dimensum spatium. [illegible]

[illegible]

[illegible] provinciam, immittere: quod munus Aristo- [illegible] nihil scivit aut credidit, ipsis motuum auctori- [illegible]. Et sectatores Aristotelis, quin et Scaliger [illegible] aperte disputant, hunc motum orbium esse volun- [illegible] voluntatis illis esse intellectionem et desiderium.[25]

[illegible] Purbachium redeamus, cum eo alii quidam, praecipue [illegible] scriptores, primum schema sic explicant, ut imagi- [illegible] orbem solidum concentricum crassitudine epicycli totius, [illegible] in epicyclo planetam. His igitur duobus orbibus tri- [illegible] motrices (si considerationem physicam pertexant) [illegible] proportione virtutis, ut eodem tempore periodos suas in [illegible] absolvant.

[illegible] requirit duos deferentes (adhuc quidem immobiles, [illegible] simplicitate manemus, mente removentes progressum [illegible] orbem, crassitudine corporis planetarii, in eoque orbe [illegible] contentione illum circumagat in plagam eam, in [illegible] est. Concessa igitur hac soliditate orbium et [illegible] in primo schemate BC, BE, paralleli; in altero [illegible] ibit: etsi motores nec illic ad AC, nec hic ad β [illegible] enim materiali necessitate seu dispositione et conti- [illegible]

[illegible] Brahe certissimis argumentis soliditatem orbium de- [illegible] illis motricibus (caecis etiam) pro baculo [illegible] debitam inveniendam; et proinde planetae in puro [illegible] in aëre cursus suos conficiunt; aliter nobis igitur [illegible] philosophandum.

[illegible] initio positum, vim omnem, qua motus hujusmodi [illegible] corpus inhabitare nec extra id quaerendam. [illegible] vi in puro aethere perfectum circulum con- [illegible] schemate epicyclum, in secundo eccentricum, mani- [illegible] fore munia; alterum, ut facultate polleat [illegible] et scientia praeditus sit inveniendi circu- [illegible] auram aetheream nullis hujusmodi regionibus [illegible]. Nihil mihi dicas, ipsam motricem fa- [illegible] animae sobolem, aptam natam esse ad circu- [illegible] lapidis natura sit per rectam lineam descendere; [illegible] non rectam a Deo conditum esse prae- [illegible] intra quidem corpus humanum omnes musculi [illegible]

[illegible]

ficitur, ut pondere majore deorsum tendente aqua [illegible]
Quodsi etiam perfecte circularis motus esset quorundam [illegible]
non sunt perpetui, nec mirum de eo esset, cum [illegible]
praesideat in humano corpore; at certe, si via ulla [illegible]
quam motricem sic instruendi, ut corpus aliquod gyrare [illegible]
in humano corpore neglecta.

Porro ut mens aliqua viam monstret circularem [illegible]
vel corporis alicujus, quod pro accessu vel recessu majore [illegible]
appareat, id fieri nequaquam potest. Circulus enim [illegible]
perficitur, aequalitate scilicet distantiae a medio et [illegible]
hasce facultates extollas, circulus tamen ne Deo quidem [illegible]
quod jam dictum. Docent quidem geometrae, datis tribus [illegible]
punctis continuare circulum: sed hoc ipso praesupponitur [illegible]
cumferentiae (utpote per trina puncta iens) jam confectum [illegible]
netae hoc initium ostendet, ex quo reliquum iter [illegible]
aliter non potest, quin planetae motor ex Avicennas [illegible]
centrum orbis sui suamque ab eo distantiam [illegible]
quadam proprietate circuli praestanda ad [illegible]
juvetur.

Jam igitur aliter nobis informabitur hypothesis [illegible]
schematum. Nam in posteriori, quod simplicius est, [illegible]
quod posuimus, motorem, qui planetam per iter [illegible]
planeta inesse, necesse itaque fuerit, in planetae [illegible]
animadversionem apparentis magnitudinis ipsius corporis [illegible]
inspecta (vel quasi inspecti) propterea que planetam [illegible]
incedat (quod praestant integrae et [illegible]

ipsa sine corpore in B concentrico aequali virium contentione corpus in A, aequalesque ab eo tueatur distantias; altera C corpore planetae, quae virtutem incorpoream in B animad- eam propinquitatem aestimare et tueri, denique et abiliter possit. Rursum itaque haec virtus in pluribus et per se incredibile, virtutem aliquam immateriatam ere, moveri in loco et tempore, nec tamen habere sub- inquam movere de loco in locum. Atque ego horum hoc ago, ut tandem obtineam, non posse fieri ut vel in corpore planetae vel alias in orbe ejus inha- ad formas motuum alias faciliores persuadendas. ὑποθέσεως, si nempe astronomia de schematibus his planetae sit, talis perfectus circulus eccentricus; quae si speculationes quoque physicae mutabuntur.

hypothesium aequipollentia non tantum apparentes anguli etiam verissima planetarum itinera per auram aetheream [illegible]

Caput III.

[illegible]

Fig. 50.

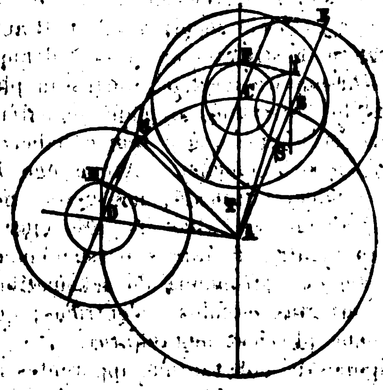


Fig. 51.



sic EAI, ... aequales etiam FA, ... HA, ... arcus EH ... aequales et similes, ut et FI ...

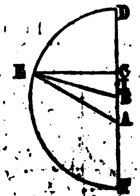
Manente itaque via sideris eadem, oculo vero ... versae sequentur apparentiae idque iisdem temporum ... loca eadem diversimode inspiciuntur ex β et ex α. ... oculo in A, et quantitate viae sideris EG, IH, situ ... sum sidus apparebit locis diversis, etsi eodem itinere ... totum iter translatum est. Cum ergo planeta, sive ex α ... ex β, utrinque eodem momento in δ sit, vel in ζ, et ... polleant, quare et I, E, loca diversarum epicyclorum ... planeta possideri dicendum est, itemque et G, H. ...

Caput IV.

[illegible] imperfecta inter duplicem epicyclum in concentrico vel [illegible] epicyclum et inter aequantem in eccentrico.

[illegible] haberet, si locus esset hypothesi simplici capitis tertii [illegible] superiorum planetarum inaequalitate prima. Verum Ptolemaeus [illegible] primam et simplicem inaequalitatem demonstrandam opero- [illegible]

Fig. 52.



[illegible] eccentricus DE, *cujus eccentricitas* [illegible] *locus oculi. Acta linea per* BA *ostendet* [illegible] *in* E *perigaeum. In hac linea supra* B [illegible] *extendatur aequale ipsi* BA. *Erit* C [illegible] *punctum nempe, apud quod planeta* [illegible] *conficit aequales angulos, quamvis* [illegible] C *sed circa* B *ordinet.*

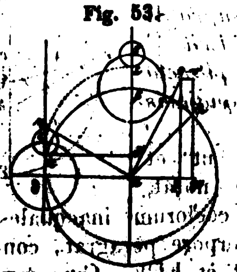
[illegible] hypothesin (cap. 4. lib. V. ut et [illegible] cetera hoc quoque nomine notat, [illegible] physica, statuens motus coelorum inaequales. [illegible] in circulo, quem planeta corpore peragrat, con- [illegible] A; et sit jam DCE rectus, ut et ECF. Cum ergo [illegible] constituti nempe aequalibus temporibus, et DCE [illegible] CEB interiores; ergo parte CEB ablata residuus CBE [illegible] DCE; itaque FBE major quam DCE vel FCE. [illegible] DBE angulum, et EF arcus angulum EBF; minor [illegible] planeta per eos aequalibus temporibus. Ergo [illegible] Copernicus) in quo haeret planeta, [illegible] incedit ex D in E, velox, cum ita ex E in F. [illegible] velox, jam tardus est. Quod Copernicus ut [illegible]

[illegible] orbi solido undiquaque aequabili, non [illegible] absurda et ego rejicerem. At quia [illegible]

cessus et recessus sic moderetur, ut iter ipsum DE fiat [illegible]
igitur ei intellectum et affectationem circuli inesse et [illegible]
nem tarditatis et celeritatis propriae a virtutis extranea [illegible]
astronomiae demonstrationes observationibus nixae testentur [illegible]
non esse omnino circularem, contra quam haec habet hypo[illegible]
physica haec consideratio aliter instituetur liberabiturque [illegible]
tam operosis requisitis.

Sed revertor ad Copernicum. Is absurditatem jam [illegible]
tentia explicatam fugiens pro aequante alterum substit[illegible]
modum. *Centro α intervallo αβ, quod sit aequale ipsi* [illegible]
batur concentricus βδ, ut visus [illegible]
parallelos αβ continuata utrinque, [illegible]
angulus aequalis ipsi DCE. [illegible]
I: *et centris β, δ, intervallis* [illegible]
aequalis ipsi AI, *scribatur primus* [illegible]
cyclus: sitque δζ parallelos ipsi [illegible]
γ, ζ, intervallis vero γε, ζη, [illegible]
IG, *describatur secundus epicyclus* [illegible]
in consequentia duplis ad [illegible]
primi epicycli in antecedentia [illegible]
[illegible]

Fig. 53.



[illegible]

[illegible] quam in ipso perigaeo, quod Tychoni, quatenus hic [illegible] in Lunaribus evenit.

[illegible] simpliciter aequipollere binas has hypothesium formas [illegible].

[illegible] quidem forma compendiosius quam ab ipso [illegible] potest in hunc modum. Primum in trian[illegible] ECB vel DCE anomalia media *), datur [illegible] eccentricitas aequantis et BE radius orbis. [illegible] ad sinum ECB sic CB ad sinum CEB; [illegible] interiores et oppositos CEB et CBE [illegible] ex DCE rejecto, relinquetur CBE. In [illegible] angulus ad B datur cum lateribus circa [illegible] BA eccentricitas eccentrici, EB vero est [illegible] legem igitur hujus triangulorum formae datur [illegible] vero dabatur CEB, tota ergo CEA aequatio dabitur. [illegible] numeris Martis motui familiaribus. Quamvis enim Ptole[illegible] anomalea: Copernicus tamen hac lege solutus alias [illegible] adsciscit, quod et Tycho Brahe imitari instituit. *Sit* [illegible] BE 100000, *et sit primo* DCE 45°, *cujus* [illegible] 100000 *ad* 70711 *sic* 7560 *ad* 5346 *sinum arcus* [illegible] CEB. *Aufer a* 45°, *restat* CBE 41° 55′ 8″, *cujus* [illegible] *arcum tangit* 38304. *Et cum sit* EB 100000, [illegible] 87400, *multiplicata in radium et divisa in* [illegible] 77820; *quod multiplica in superiorem tangentem* [illegible], *scilicet* 29732, *id tangit arcum* 16° 33′ 30″. [illegible] *dimidio ipsius* CBE *relinquit* 4° 24′ 4″, *nempe* [illegible] CEA *est* 7° 28′ 56″ *in forma quidem Ptole*[illegible]icana, quamvis ordinaria ratio quaerendae aequa[illegible] Lunaribus tomo I. Progymnasmatum et ex Coper[illegible] tamen jam extra ordinem ratione alia, quae accom[illegible]. *Sit* [illegible] (Fig. 53) 45° *et* [illegible] 16380, [illegible]

Fig. 5[illegible]



[illegible]

forma Copernicana tota ηδ, quae aequat CA, fit [illegible]
et δα radius. Ergo ηαδ est 11° 23′ 53″. *Differentia* [illegible]

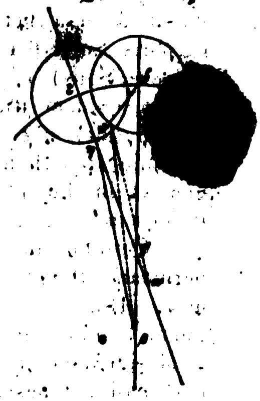
Ita vides, quod aequationem eccentrici*) [illegible] desse, quo minus hypothesium formae aequipolleant. [illegible]

Discrepant tamen in distantiis planetae a [illegible] prosthaphaeresibus annuis. Nam in forma Ptolemaica [illegible] AEO ad AC, ita sinus totus ad AE, quae fit 101766, [illegible] At in Copernicana ηα secans est anguli ηαδ, scilicet [illegible] 246 particulas, quae in prosthaphaeresi orbis annui [illegible] cere possunt, ut infra parte quarta patebit. Possumus [illegible] aequationum differentiam obliterare, si, quam Braheus [illegible] in forma Copernicana invenit 20160, eam in forma [illegible] 20103. Distantiae vero formae Copernicanae Ptolemaicae [illegible] aequari, nisi aequatio 43 minutis varietur. In quadam [illegible] hypothesi tabularum Lunarium Tychonis duos illos [illegible] in talem eccentricum Ptolemaicum cum aequatoris [illegible] minus tamen et epicyclum addidi propter [illegible] aequalitatem.

Denique cum per cap. II. in hac forma [illegible] cum suo concentrico perfectissime aequipollentia [illegible] cum, cujus eccentricitas sit aequalis semidiametro [illegible] addito ergo epicyclo minore ipsi huic eccentro [illegible] centro epicycli, paria faciens ad anguem cum [illegible] hoc ipso ab eccentrico Ptolemaico cum [illegible]

Caput V.

Fig. 55.



[illegible] aequipollentem, diversae tamen appa- [illegible] translatione visus ex α. [illegible] per finem capitis III., etiam manente [illegible] eccentrico, lineisque parallelis ma- [illegible] quantitate manente situs solum- [illegible] Quod autem jam instituimus, sic per- [illegible] loco visus extra priorem lineam [illegible] ut βγ sit quantitas alia ab αγ, novae [illegible]tatis vel novae semidiametri epicycli [illegible] per βγ novam lineam apsidum βδ, et [illegible] priori aequalem. Quamvis vero [illegible] in δ apside, non tamen ponemus [illegible] puncto ipsi γ proximo ut prius, sed [illegible] γβδ, duplum ei statuemus angulum [illegible] planetam in θ locabimus, quando epi- [illegible] enim collocaretur planeta, etiamsi visus in α [illegible] Hoc itaque pacto ad unguem eadem veritas manet [illegible] apparentia vero mutatur: quando enim incli- [illegible] ut hic βθ, αθ vel βη, αγ, tunc etiam in diversa [illegible]

[illegible] visoriae lineae parallelae sunt, in diversa loca [illegible] agitur opus esse ad hoc, ut ad se mutuo inclinentur. [illegible] hoc est, sed tunc interceptum spatium fixarum [illegible] visum non est sensibile, nisi distantia paral- [illegible] fixarum sensibilis.

[illegible] physica, praeter ea, quae cap. III. dicta, hoc quoque [illegible] identitatem in variata apparentia erit statuen- [illegible] epicyclus est commissus, ad aliud punctum am- [illegible] majoris epicycli: restituitur enim epicyclus [illegible] secunda positione ad lineam βδ, minor vero ad [illegible] eccentricitatem, quia visus in secunda positione in [illegible] (visu in α constituto) uterque epicyclus [illegible] Non itaque simpliciter eadem forma hypothe- [illegible] planetae obtinentur. Quodsi etiam in [illegible] restituendo utrumque epicyclum ad [illegible] manente eodem eccentro utrinque [illegible] alius [illegible] ut [illegible] hypotheses Ptolemaicae ad [illegible] planetae variabitur. [illegible] ergo [illegible] inaequalitas [illegible] IV, igitur [illegible]

Ego vero, dum Copernicum ad meam ejus libri [illegible] habui diversa fictione. Visus enim ab illo puncto [illegible] corporis Solis per imaginationem transferendus fuit, atque [illegible] [illegible]ore Solis) computandi fuerant abscessus corporum [illegible] [illegible] quidem itinere, quod Copernici suppositiones [illegible] [illegible]patuit) non plane idem iter causa particularium [illegible] [illegible] mihi per hanc translationem lineas apsidum, differe[illegible] gua et in illo quidem libello plane nullius momenti; ibi [illegible] itineris agebatur, qui hoc pacto mansit.

Ceterum in sequentibus ad vitandam confusionem [illegible] pernicano (quem non stella, sed centrum epicycli [illegible] utar. Differt enim ab ipsissimo itinere planetae, quod [illegible] gaeo, humilius in apogaeo. At voce eccentrici [illegible] in designando ipsissimo itinere planetae, vel puncti in [illegible] inaequalitas inest, quo pacto tantummodo Ptolemaicum [illegible] proxime talem) par est nos imaginari. Ostensum enim [illegible] discrepaturum nostrum calculum aequationis (Ptolemaico [illegible] Copernicano tantummodo duobus scrupulis, ubi maxime [illegible] facilior est modus computandi in forma Ptolemaica [illegible] tatis quam in Copernicana. Denique haec Ptolemaica [illegible] qualitatis (ut dictum) ipsi [illegible] naturae et sequentibus [illegible] [illegible] parte tertia et quarta est accommodatior. [illegible] [illegible] cui lubet, poteris [illegible] semper tunc quoque [illegible] [illegible] hoc capite quinto [illegible]

Accedo jam ad priorem [illegible] particularit[illegible] [illegible] hypothesibus [illegible] [illegible] demonstrabo. [illegible]

[illegible] Centro [illegible]

[illegible]

[illegible] eccentricitatis mutata. Cum autem certum sit, uno et [illegible] in coelo unum et idem iter confi[illegible], non vero [illegible] aliud ex α: certum igitur et hoc [illegible] non posse [illegible] utrique (et qui in α et qui in δ) videri aequalis [illegible] Sit enim portio veri itineris planetarii $\iota\eta$, atqu[illegible] [illegible] tempore, puta diebus 20: cum igitur α sit [illegible] [illegible] igitur apparebit $\iota\eta$ in α, quam in δ, per demon[illegible] [illegible] 20 diebus planeta plus videbitur promotus ei qui in α, [illegible] cum quilibet planeta perpetuo certum et eundem [illegible] dierum, quibus restituitur ad idem fixarum punctum, tardi-[illegible] celeritate compensari oportet. Cum ergo planeta in por-[illegible] tardior ei qui in δ, in alia igitur portione eidem qui in [illegible], quam ei qui in α. Unde fit, ut alio loco tardissimus [illegible] alio ei qui [illegible]. Ipse tamen planeta verissime non [illegible] loco suae orbitae tardissimus esse.

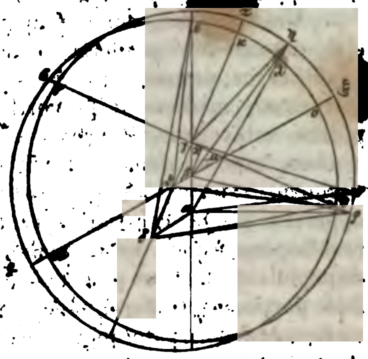
[illegible] quaeritur, an unum et idem verum in coelo iter [illegible]) utrasque apparitiones repraesentare possit [illegible] in α, utrique suas et tales, quales Ptolemaicae [illegible] concedunt et admittunt.

[illegible] in omnibus orbitae partibus aequalis celeritatis esset, [illegible] tertium, quod sic. Sed quia planeta in uno se-[illegible] est vera et reali mora, in opposito velocissimus, [illegible] quod non plane. Causa haec est, quod duae retar-[illegible] altera realis et physica in uno eccentrici loco; altera [illegible] loco non jam uno, sed illo, qui a quolibet suscepto [illegible]. Quando ergo visus α in lineam [illegible] β centrum [illegible] ductam incidit, in parte lineae [illegible] [illegible] aequantis, tunc utraque tarditas in idem [illegible]. Quando vero discedit visus ex hac linea [illegible] per [illegible] centrum circuli ostendit tarditatis [illegible] physica [illegible] sit. Atque harum inaequalitatum [illegible] locum inter-[illegible]

[illegible]

lineam $\delta\beta$, et ipsi $\alpha\beta\gamma$ aequalis fiat $\beta\mu$, plane [illegible]
sed planeta [illegible]n in ι sed in η fit tardissimus, [illegible]
igitur in [illegible]e planetae quod mutari non potest, quia [illegible]
[illegible]optica [illegible] observatorum visionem sequitur. Etsi [illegible]
[illegible] $\iota\eta$ iter conficeret, quod in α majus, in δ minus [illegible]
[illegible] hujus temporis consideres, vehementer turbabitur [illegible]
[illegible]n ad partes hujus itineris, multoque magis in partib[illegible]
sunt interjectae inter lineas $\iota\eta$. Inprimis mutabitur [illegible]
num quantitas notabiliter, si ei qui est in δ hoc eripueris [illegible]
in ι tardissimum esse, hoc est si punctum aequantis [illegible]
Ducta enim recta per $\gamma\mu$ in circumferentiae punctum [illegible]
sola haec aequatio $\alpha\gamma\mu$ aequalis priori $\alpha\gamma\eta$; supra [illegible]
μ erunt minores, infra π majores: ut in η angulus [illegible]
quam $\gamma\eta\alpha$. Tum autem neque factum [illegible]c est, quod [illegible]
scilicet prior forma hypotheseos plane constituta est [illegible]
$\beta\gamma$ sic $\delta\beta$ ad $\beta\mu$: nam $\beta\mu$ aequalis est ipsi $\beta\eta$ [illegible]
autem facias ut $\alpha\beta$ ad $\beta\gamma$ sic $\delta\beta$ ad $\beta\mu$, major [illegible]
quitur, multo magis vitiatum iri visui in α suam [illegible]
etiam maximam, propter auctam scilicet eccentricitatem [illegible]
alio loco planeta futurus est tardissimus quam [illegible]
quide[illegible] majore tarditatis verae mensura. Apparet [illegible]
nobis expetitam institui non posse trajecta linea [illegible]
tum eccentrici, cumque simul patuerit, quanti [illegible]
aequantis retineatur, omnino igitur [illegible]
Quid [illegible] futurum est, si [illegible]
aequantis [illegible] trajiciatur et [illegible] hypothesis [illegible]
scilicet si [illegible] eccentrici ex β in lineam [illegible]
ad $\beta\gamma$ sic [illegible] ad [illegible], ut sit θ centrum eccentrici [illegible]
[illegible]

Fig. 66.



[illegible] sed qualium βξ [illegible] σξ erit 860. [illegible] inveniamus, quo [illegible] visui in δ mutentur [illegible] transpositionem [illegible] sic est agen- [illegible] centrum, in [illegible] tempora, notet ergo [illegible] utraque hypothesi idem. [illegible] decurrat, [illegible] aequatione $\delta\epsilon\gamma\iota$ sin [illegible] erit in [illegible] coincidentibus lineis $\alpha\iota$ [illegible] motus. Rursum [illegible] tempus, cujus sit mensura $\iota\gamma\zeta$ vel $\epsilon\gamma\kappa$ (cui ad verticem [illegible] jam inventus est 5° 27′ 47″) sit momentum aliquod [illegible] designatum? Erit igitur tunc planeta per eccentricum ϵo [illegible] per $\iota\xi$ vero in ζ cum aequatione $\gamma\zeta\kappa$. Ita semper [illegible] in linea ex γ ejecta, ejusque puncto, in [illegible] secat [illegible] Quodsi oculus esset in γ, nulla fieret apparen- [illegible] planeta in κ esset sive in ζ. Sed quia visus in hoc [illegible] in δ, a me in α, quaeritur ergo, quo loco [illegible] eccentricorum in hac linea ex γ ejecta sit visui in [illegible] Ut illa fiat sensibilis, concurrunt tria: primum ut [illegible] magna, quo pacto circa $o\xi$ et $\varrho\pi$ est [illegible]; deinde [illegible] objiciatur visui in δ, quo modo in [illegible] κ et oppo- [illegible] principia optica; in locis igitur intermediis infra ξ [illegible] tertio, ut sit propinqua ipsi δ, qua ratione [illegible] infra ξ, eo quod centrum alterius eccentrici β ad [illegible] declinet. Quodsi angulum rectum constituamus [illegible] perpendicularis ex γ in circumferentias ejecta, quam [illegible] maxima est haec apparentia. [illegible]

[illegible] 7411 [illegible] 5° 27 [illegible]

rentia horum angulorum 4′ 24″, *angulus scilicet σδτ, quia* [illegible] *minor quam νφ, utpote sectioni* [illegible]

Videtur, quam propinque relinquatur visui in [illegible] etsi novum iter planetae in coelo per translationem [illegible] hypotheseos supponatur. Et tamen relinquitur adhuc [illegible] motum medium et proportionem eccentricitatum [illegible] radium orbis nonnihil variet, siquidem id ipsi futurum [illegible] randam hanc qualemcunque 5′ discrepantiam. Ita [illegible] tissimum refertur ad inaequalitatem primam [illegible] apparent prope centrum eccentrici. At in [illegible] prosthaphaeresibus orbis annui multum refert [illegible] aequipollentia), utrum planeta in ξπ circumeat an in [illegible] 246 particulas (differentiam inter Ptolemaicam et [illegible] contemnere non poteramus; multo minus hic jam [illegible] sione 1344 praeteriverimus. Id autem quantum [illegible] loco Martis, sequenti capite videbimus.

Transposuimus hactenus visum ex δ in [illegible] eadem fere sequantur visu manente, transposito [illegible] appareat, idem hoc capite fieri posse in eccentrico, quod supra in fine capitis tertii fieri potuit in [illegible] enim [illegible] visus seu centrum eccentrici [illegible] hic similiter, seu visus seu centrum aequ[illegible] eadem. Est autem necessarium demonstrationem [illegible] medere propter magnam opinionum dissensionem [illegible] in demonstranda secunda planetarum inaequalitate [illegible] capite fac[illegible] negotium.

Fig. 27.

Praeterea [illegible]

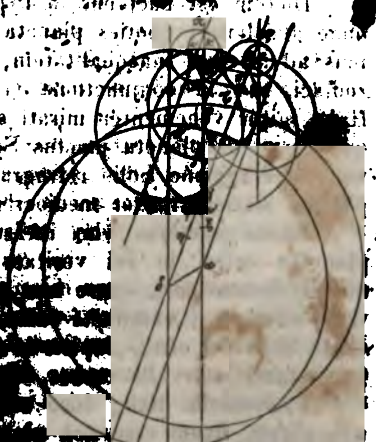
[illegible]

[illegible] temporibus interlapsis constituerit hypothesin talem; [illegible] eccentricitas eccentrici δα, et δρ eccentri[illegible] aequantis; [illegible] vero superveniens observata [illegible] tempora [illegible] observet articulos et puncta, quibus pla[illegible] non medio [illegible] Solis fuit oppositus) exque his locis et temporibus ipse [illegible], in qua visus in δ vel A relinquatur, eccentr[illegible] [illegible] eccentrici novi BI, et novi aequantis Γ eccentri[illegible] [illegible] novum I: quaeritur jam, si prior artifex pristino [illegible] adjungat novum eccentricum BI, an multo alia [illegible] planetae sub fixis per calculum sit proditurus, quam ipse [illegible] invenerat: intellige quoad primam inaequalitatem; [illegible] inaequalitate et quid quantumque hac ratione in illa [illegible] est. Respondetur ex hac aequipollentia trans[illegible] [illegible] discrepantia futura sit, eaque maxima circa puncta [illegible] plane ut prius visu transposito: nisi quod jam νΦ [illegible] quam [illegible] ν: itaque angulus Φδν, qui prius [illegible] 4' 48". Contrarium in σ, T accidit.

[illegible] est igitur in eccentrico Ptolemaico, quid turbarum oria[illegible] [illegible] planetae cum apparente loco Solis usus, seu [illegible] transponat novumque eccentricum extruat.

[illegible] aequipollentia in forma Copernicana seu Tychonica, quae [illegible], repetitis verbis demonstretur, non opus esse cen[illegible] doctrina in fine cap. III. docebo, et hunc planetis con[illegible] [illegible] aequante ejusque in alias quantitates aliosque [illegible] delineare per binos illos epicyclos Copernicanos, [illegible], iter vero planetae per aur[illegible] aetheream [illegible] caput fieri potest) invariatum maneat, quod [illegible] fieri posse.

Fig. 58.



[illegible]

thesin vero ex α, *incidit in* $\nu\upsilon$; *ubi vides, quod puncta* μ, υ, *item* τ, ν *parum differant, illa ex* δ *haec ex* α *inspecta, quando planeta circa apsidas versatur. At versus longitudines medias haec puncta tantum a se invicem dissidebunt, quantum in priori schemate* υ *et* Φ *dissident, eruntque omnia quam proxime aequalia et demonstrationes omnino eaedem. Continuatis enim* $\vartheta\iota$, $\varepsilon\varkappa$ *ad concursum* π, *et* $\zeta\lambda$, βo *ad concursum in* ϱ, *erunt* $\vartheta\pi\varepsilon$, $\zeta\varrho\beta$, *triangula aequalia ubique triangulo* $\delta\gamma\alpha$, *et latera lateribus parallela.*

At quia demonstrationes hae per se satis erunt perplexae neque consultum, ut coacervatione epicyclorum et epicycliorum Copernicanorum seu Braheanorum magis involvantur, ideo in sequentibus et hanc formam Copernicanam seu Tychonicam primae inaequalitati tributam valere jubebimus: nam ipsa secundae inaequalitatis ratio hypothesium trigemina ubique futura abunde satis nobis exhibebit negotiorum. Quicquid autem per Ptolemaicum aequantem cum eccentrico demonstraverimus, jam statim postulo ut pro demonstratis in hoc quoque Copernicano seu Braheano concentrico cum duobus epicyclis vel eccentrepicyclo accipiatur: nam perexigua inventa est differentia supra cap. IV.

Caput VI.

De aequipollentia hypothesium Ptolemaei, Copernici et Brahei, quibus inaequalitatem planetarum secundam demonstrarunt, et quid singulae a se ipsis differant, quando ad apparentem et quando ad medium Solis motum accommodantur.

Dictum est hactenus de hypothesibus primae planetarum inaequalitatis, quae absolvitur, quoties planeta ad idem signum zodiaci redit. Nunc transimus ad alteram inaequalitatem, quae non in constanti aliquo et uno signo zodiaci, sed in conjunctione vel oppositione Solis cum planeta absolvitur. Hanc igitur vehementer mirati sunt homines: causamque alius aliam attulit, qua fieret, ut planeta junctus Soli redderetur velox, directus, altus et parvus, at e regione Solis retrogradus, humilis et magnus, intermediis temporibus stationarius et mediocris.

Latini auctores vim inesse censuere Solis aspectibus et radiis, qua planetae ceteri in rei veritate attraherentur: quorum sententia numeris nequit demonstrari, quare non est astronomica: sed nec verisimilis, inventis veris causis: et manifeste falsa, cum Saturnus incipiat retrocedere in quadrato Solis vel ultra, Jupiter in trino, Mars in biquintili vel ante sesquadrum, inconstanti intervallo omnes.

Ptolemaeus dixit, loco certo circuli planetarii, qui sufficit primae inaequalitati, fixum esse non planetam ipsum, sed centrum epicycli planetam in sua circumferentia fixum vehentis, qui vicissim vehatur a circulo illo planetae capitali: formam motus hanc esse, ut si centrum epicycli sit cum Sole, planeta quoque sit in epicycli summo moveaturque cum Sole versus plagam eandem, Sole a centro hujus epicycli recedente (velocior enim est illo), planetam simul descendere in epicyclo: cum autem motus epicycli sit velocior circa suum centrum quam motus centri circa Terram, hinc fieri

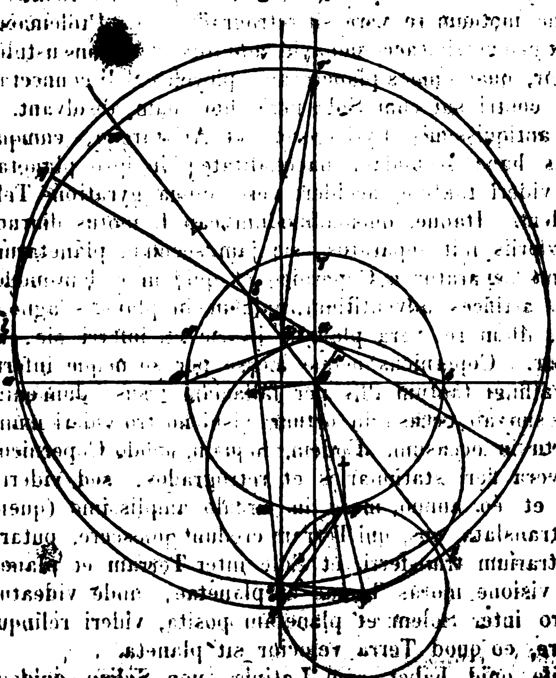
[illegible] epicycli inferiores peragrat, centro epicycli versante in [illegible] motuum re vera sit retrogradus. [illegible] Ptolemaeus [illegible] et geometriae accomodavit, admiratione[illegible] sustulit. [illegible]tur, quae omnes planetarum epicyclos Soli connectat, [illegible] centri sui cum Sole periodum suam absolvant.

[illegible] antiquissimis Pythagoreis et Aristarcho, cumque [illegible] hanc secundam inaequalitatem in ipso planetae [illegible] videri tantum, accidere vero annua gyratione Tel[illegible]bilem. Itaque, quemadmodum cap I. motus diurnus [illegible] propriis fuit separatus, sic jam secunda planetarum [illegible] prima separatur a Copernico et quidem eodem modo. [illegible] alii artifices adventitium quidem in planetis agnos[illegible], illum re vera planetis inesse et inferri sic, ut [illegible]. Copernicus neque inesse per se neque inferri [illegible] affingi tantum illis per fallaciam visus: dum enim [illegible] suo ab occasu in ortum, visui nostro videri [illegible] ab ortu in occasum. Eodem, inquam, modo Copernicus [illegible] vera fieri stationarios et retrogrados, sed videri: [illegible] et eo annuo motu in circulo amplissimo (quem [illegible]) translata, eos, qui Terram credunt quiescere, putare [illegible] contrarium transferri, et Sole inter Terram et plane[illegible] visione motus Terrae et planetae, unde videatur [illegible] vero inter Solem et planetam posita, videri relinqui [illegible], eo quod Terra velocior sit planeta.

[illegible] simile quid habet cum Latinis, non Solem quidem [illegible]pactum, sed planetas adulari Soli: [illegible] enim, ut [illegible]

[illegible]

Fig. 59.



... velocitas. Copernicus ...

... (translatores) qui ... putare contrarium ... inter Terram et plane- ... in visione nostra ... planetae, unde videatur ... vero inter Solem et planetam posita, videri relinqui ... eo quod Terra velocior sit planeta.

... simile, quid habet cum Latinis, non Solum quidem ... aspectum, sed planetas adulari Soli: ... enim, ut

[illegible] haec hypothesis omnibus locis observatis sub [illegible] planetae cum medio loco Solis. [illegible]

[illegible] Keplere, quod hic desideres in Copernico? Anne [illegible] astronomorum experimentis negas hanc hypothesin per [illegible] quidem jam non agitur. Neque ego, cum hunc la[illegible] observationibus in diversam sententiam sum adductus. [illegible]deravi: *Continuetur* $\beta\delta$ *ut secet eccentricum in* χ, ξ; [illegible] *eccentrici, quod sit* τ, *connectaturque cum* δ, λ; [illegible] *angulum* $\chi\lambda\tau$; *angulus vero* $\chi\delta\tau$ *major sit angulo* [illegible] *et sit* δ *punctum aequalitatis temporariae; ergo tempus* [illegible] *est majus respectu totius periodi temporis per* [illegible] *arcus* $\chi\tau$ *respectu circumferentiae totius: tardus* [illegible] *(non jam per visus phantasiam) per arcum* $\tau\chi$, *velox* [illegible] *in* χ *tardissimus, in* ξ *velocissimus. Neque tamen* [illegible] *a* π *Sole, neque in* ξ *proximus fit ipsi* π. At [illegible] adeo hypotheseos hujus, quam circa β punctum [illegible] consentaneum efficitur, hanc realem retardationem pla[illegible] a corpore Solis, accelerationem ex appropinquatione [illegible]. Contra ne cogitatione quidem comprehendi [illegible] puncto β (quod caret corpore), potius, quam in π [illegible] Sol, cor mundi); quae vis planetam pro ratione [illegible] tarde vel velociter circumagat. Ac etsi quis jam [illegible] et accelerationes hujusmodi ex intimo eccentri[illegible] oriri, statuat igitur has affectiones motus esse [illegible] facultates motrices in corpore planetae residentes, [illegible] obtinebimus. Nam quae [illegible] [illegible] puncto δ (quod geometricam habet affinitatem ad [illegible] non exiguae magnitudinis) ad β punctum [illegible] semidiametris (vel secundum auctores, dia[illegible]) ab ipso Sole remotum et corpore vacans nullaque [illegible] substratum? Adde quod Copernicus lib. V. [illegible] Solem in π plane fixum esse ideoque eccentrici [illegible] quod pro centro habet orbis [illegible] [illegible] itaque $\beta\delta$ breviorem factam [illegible] non est amplius in centro mundi, aut olim non [illegible] vel originem motus ex centro mundi esse [illegible] igitur ad β sed ad π [illegible] id quod centro mundi competit. His [illegible] [illegible] pro inaequalitate [illegible] sed per [illegible] [illegible]

[illegible]

medii motus Solis $\upsilon\beta$ in Ariete, linea vero visionis [illegible] cise illi opposita, nempe $\upsilon\omega$. Cum igitur $\upsilon\alpha$ sit [illegible] sequentia, apparens igitur Solis locus est ultra planetae [illegible] υ sit Terra, visus domicilium, et ω planeta, et uterque [illegible] velocius tamen υ Terra; linea ergo $\upsilon\omega$ posteriori [illegible] inclinatur ad lineam $\upsilon\varkappa$ visibilis loci Solis: antecessit [illegible] sitio mediam. Tempore igitur, quod antecedit momen[illegible] quod sit $\beta\vartheta$, planeta in lineam ex $\varkappa$ per ϑ eductam [illegible] Et tunc $\vartheta\zeta$ linea visionis planetae (quod inexercitatis [illegible] notet) plus in consequentia vergit sub fixis, quam $\upsilon\omega$ [illegible] quia etsi $\vartheta\zeta$ praecedit lineam $\upsilon\omega$ in antecedentia, tamen [illegible] ϑ, υ et omnia omnino puncta per Terrae circulum unum [illegible] sphaerae fixarum essent: quare non distantia terminorum [illegible] natio linearum $\vartheta\zeta$, $\upsilon\omega$ efficit, ut lineae in diversa [illegible] eadem ad sensum coincisurae, si paralleli fuissent. In[illegible] ω patet inde, quod idem tempus supponitur, quo [illegible] Terra ex ϑ in υ movetur. Terra vero velocior est [illegible] spatium $\vartheta\upsilon$ Terra conficit, quam est $\zeta\omega$ spatium plane[illegible]

Sed esse planetam antecedenti tempore plus in [illegible] etiam doceri potest, cum sub oppositionem sit retrogradus [illegible] comitat. Apparet itaque, quid in hac reductione a[illegible] Solis motum in locis inaequalitate secunda exutis [illegible]

Nam in υ et opposito loco pristina loca manent [illegible] visa, quia $\vartheta\zeta$ (ut dictum est) magis in consequentia [illegible] mitur tempori interlapso, quia $\vartheta\zeta$ est visio tempore [illegible] opposito loco fit contrarium, tempori scilicet addito [illegible] ibi loca haec planetae a pristinis multum dissidentia [illegible] de more instituta, effectus producet multo alios. [illegible]

[illegible]

… utrumque eccentricum in duobus punctis infra et supra, … intercapedinem $\epsilon\varrho$ aequalem ipsi $\lambda\mu$. Sed quia … lineae ex δ designant certa et eadem momenta tem… habemus, ducatur igitur $\delta\varrho$, secans eccentricos in ϵ, ϱ, … mento planeta hic in ϵ, illic in ϱ certo incidat. Terra … ante, scilicet in π, planeta sive in ϵ sive in ϱ con… in loco zodiaci videbitur: nam linea $\epsilon\varrho$ ratione … apparet: at Terra ad hujus lineae latera utrinque ex… lineae $\epsilon\varrho$ [illegible] major atque major, quia ex obliquo … orbis Tell[illegible] visoriae per ϵ et per ϱ incedentes … discedant [illegible] angulum ad visum constituant …, si p[illegible] ponatur, quando debuit poni in ϵ. … major erit [illegible] in ϵ quam supra circa ϵ, quia orbis … visum propius ad $\epsilon\varrho$ quam ad ϵ admovet. Deinde …, ergo $\epsilon\varrho$ obliquius inspicitur ex partibus sinistris quam … igitur apparebit illic quam hic, etiam in aequali distantia … Ergo punctum nostrum quaerendum est in partibus … maximum subtendere visionis angulum visu constituto in … Terrae a circulo per $\epsilon\varrho$ ducto tangitur. Sit enim … descriptus, qui circulum $\nu\sigma$ in partibus versus σ tan… ν, et ab ϵ, ϱ lineae exeant cum in contactum ν, … circuli $\nu\sigma$ ante et post contactum. Cum igitur … solo puncto tangat, ergo omnium angulorum … in punctis circuli $\nu\sigma$ concurrentia secabuntur …

Fig. 59.



servavimus $\delta\lambda$ 7411, *qualium* $\lambda\varrho$ 100000 *et* $\varrho\lambda\beta$ 47° [illegible]
$\varrho\delta\lambda$ 44° 59′ 10″ *et* $\delta\varrho$ 105123. *Ergo in* $\varepsilon\delta\mu$, *cum* [illegible]
$\lambda\delta\mu$ *prius fuerit* 5° 27′ 47″, *totus igitur* $\varepsilon\delta\mu$ *est* [illegible]
supra 6763 *qualium* $\mu\varepsilon$ 100000. *Igitur in* $\varepsilon\delta\mu$ [illegible]
dantur, nempe $\varepsilon\mu\varkappa$ 53° 26′ 17″ *et per hunc* $\delta\varepsilon$ 104[illegible]
erat 105123; *relinquitur ergo* $\varepsilon\varrho$ 953. *Supra* $\lambda\mu$ [illegible]
esset $\varepsilon\varrho$, *si signa* ε, ϱ *essent in linea* $\mu\varrho$: *sed quia* [illegible]
inclinata ad $\mu\varrho$, *nihil igitur mireris, longiorem esse* [illegible]
jam ex β *perpendiculari* [illegible] $\delta\varrho$, *quae sit* $\beta\iota$, *in triang*[illegible]
ad ι *et* $\beta\delta\iota$ *est* 44° 59′ 10″ *et* $\beta\delta$ [illegible] 19763; [illegible]
pendicularis $\beta\iota$ 13971 *et* $\delta\iota$ 1397[illegible] 91145. [illegible]
tatem radii $\beta\nu$ *conjicere in eosdem* [illegible] *supra* [illegible]
nostrae $\beta\varkappa$ *hic respondet, assumeretur* [illegible]
supposita 100000. *Jam vero* $\lambda\varrho$ 100000 *praesupposita* [illegible]
$\beta\nu$ *supra assumta ut* 61 *ad* 40 *fere, unde cetera,* [illegible]
ut 61 *ad* 40 *sic* 100000 *ad* 65656 ⅓ *legitimam* [illegible]
Tangat igitur circulus per $\varepsilon\varrho$ *transiens circulum* [illegible]
per medium secta in o perpendicularis ipsi $\iota\varrho$ [illegible]
[illegible] *donec in* ψ *secet* $o\psi$; *erit* ψ *centrum* [illegible]
[illegible] *in linea per centrum alterius tangentis* [illegible]
[illegible] *transeunte (Eucl. III, 11), quare in* $\beta\psi$ *linea,* [illegible]
[illegible] *circuli est in perpendiculari bisecante* [illegible]
[illegible] *puncta* ε, ϱ *connectit: ergo in linea* $o\psi$ [illegible]
[illegible] *lineae. Connectatur* $\varepsilon\psi$, *et ex* β [illegible]
[illegible] $o\psi$ *in* α. *Igitur* $\beta\alpha$ *aequalis est* [illegible]
[illegible] *Sed* $\beta\iota$ *jam inventa est* 13971, $\iota\alpha$ *vero* [illegible]
Fuit enim $\iota\varrho$ *supra* 91145, *et* $\varepsilon\varrho$ 953, *sed* $o\varrho$ [illegible]
$o\varrho$ *est* 476 ½: *ablata ergo* $o\varrho$ *ab* $\iota\varrho$, *relinquitur* [illegible]
[illegible]

... huius ergo quadratum illi ipsi erit aequale. Est ... quadratum + 195188841 ʒ — 57349565416398 ℞ + ...72361.

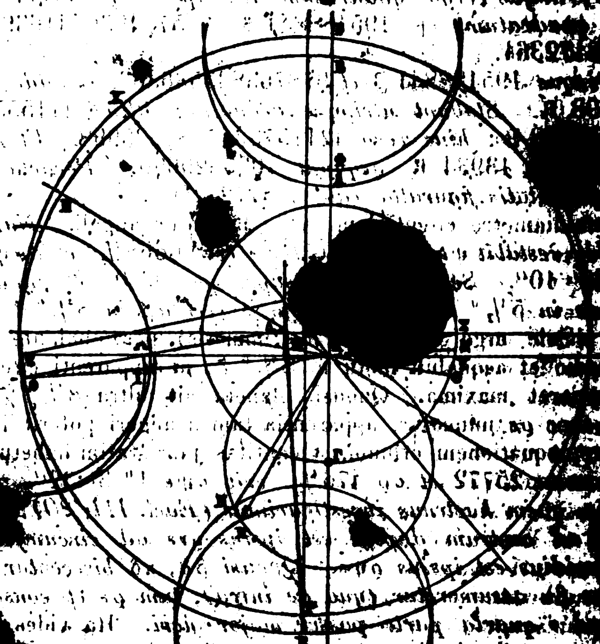
... 195188841 ʒ et 9787638355303383, et adde utrinque ... ℞. Stabunt utrinque aequalia; illinc 4115558634 ʒ ...; hinc vero 4211573342882635998. Et in mini- ... 13934 ℞ aequant 1023329690. Peracta aequa- ... figuratae valor 25772 ...)

... diametro circuli ... facile h...tur anguli. Nam ... ψο ... constabit ψ... Et βα est 90668½, et βαψ rectus, ... 40″. S... supra per 3° 0′ 6″ annuebat ad ... in 5½° ... ρι vel αβ in 8½° ♋. Ergo ... ergo ... numeris). perambulante 16° ♋, ... aequabili motu in 8½° ♑, at apparenti circa 27° ♏ ... maxima. Quodsi planeta sit ultra 8½° ♑, ultra ... ρs minuetur, apparentia tamen augeri poterit in puncto ... aequationem orbium. Quantitas jam statim habetur. Cum ... 25772 et ορ 476½, erit οψs 1° 3′ 32″. ... vero ... hactenus investigavimus (Eucl. III, 20) ... centrum duplo est ipsius ρνs ad circum... est ipsius ρψs. Quodsi βδ, κδ bisecentur, ... assumeretur (quod de infra), tum ρs et conseq... quarta parte posset major fieri. Ita vides ... traductio hypotheseos a medio ad apparent... orbis annui turbet.

... per observationes quoque st... et a consideratione causarum motricium ... planetae, quae sola bisecat iter planetae in duos ... et quantitate, hanc lineam non praeter ... sed per ipsum centrum corporis Solis transire. ... demonstrabo ex observationibus parte quarta ...

... in Ptolemaica hypothesi de- ...

Fig. 20



[illegible] ribus intercedentibus. Methodus hujus [illegible]

IX

Esto jam confecta pragmatia et [illegible]

[illegible]

Hic quae Copernico objeci de [illegible]

[illegible]

[illegible] motricum intelligentiam unam in centro epicycli collocas, [illegible] planetae, ea quae in centro Terram (corpus nempe) [illegible] Terram in circulum inaequalite[illegible] quae vero in puncto [illegible] in c[illegible] planetae) circumibit centrum [illegible]orporeum [illegible] Quaeretur [illegible] ut supra, quibus illa adminiculis id in- [illegible] circumveniat. Non en[illegible] per geometricam imagi- [illegible] geometricam sui imaginationem non admittit; nec punctum [illegible] corpore, vel imaginando subsi[illegible] potest; [illegible] imaginantes [illegible]iculis, [illegible] tabellarum v[illegible] [illegible] nos olim tractasse. At [illegible] per [illegible] virt[illegible] centro epicycli) usque ad circum- [illegible] planeta[illegible] sustulimus hunc virtutis effluxum, [illegible] composita mo[illegible] binas mentes. Quin etiam in prima [illegible] dubitatur, an virtus aliqua naturalis ad motum in- [illegible] possit in puncto aliquo subsistere, quod omni proprio [illegible] multo magis an hujusmodi incorporea virtus se ipsam circa [illegible] et de loco in locum transire possit? et mu[illegible] [illegible] effluxum ex se ipsa communicare seu inf[illegible] [illegible] nide? Nam quae sublimia de essentia [illegible] [illegible] angelorum[illegible] separatarum mentium mih[illegible] [illegible] pertinentia sunt. Disputamus enim de rebus natur[illegible] [illegible] de virtutibus nullo arbitrio ad variandam act[illegible] [illegible] minime sane separatis, cum sint conju[illegible] [illegible] vehendis. Atque haec in genere Ptolema[illegible] [illegible] Ptolemaeo dicatur, ob quod in specie [illegible] [illegible] apparentem nobiscum amplecti solet. [illegible] [illegible] (seu una, seu gemina) ad Solem respicit, ita ut [illegible] epicycli statuat (epicyclum hic intellige Ptolemaicum, [illegible]), quoties centrum epicycli e regione Solis [illegible] potius ad punctum imaginarium T (quod Solem [illegible] accedit, jam sequitur, jam supra, jam infra [illegible] corpus respiciat? aut quomodo virtus illa motum [illegible] percipere omnino possit, cum in Ψ corpus non [illegible], epicyclum ad lineas $K\Sigma$ apparentis loci [illegible] epicycli transeunt, restitui? Videamus igitur, [illegible] per apparentis motus Solis usurpationem. [illegible] Γ Sol et Ψ centrum eccentrici Solis cum K [illegible] ut $\Psi\Gamma$ apparentis et $K\Gamma$ medii motus Solis [illegible] epicycli [illegible] locum, sive per KT sive per [illegible] KT seu [illegible]T [illegible] [illegible] At [illegible] Sol [illegible] [illegible] medii [illegible] [illegible] $K\Theta$ [illegible]

epicycli Ω sunt retrogradae et celeriores ipso Z centro, ...
pore in oppositione cum Sole. Antecessit igitur hic ...
mediam. Tempore ... tur, quod momentum per KT sig...
autem K... cum Sol videtur in linea K... planeta in ...
bitur, puta in I per KI, quae est una re... cum KT ...
in hac vera oppositione exuere inaequalitatem secunda...
epi... haec linea ΞK videbitur, puta in Θ, et qu...
g... go tempore K... ore quam KT planeta ...
ri... m $K\Omega$. Sed ... $K\Omega$ ...
et ... est magis in consequentia ... Apparet ...
reductione a medio ad apparent...
mutetur. Nam in T et opposito ... lineae ...
cycli manent: in Z promovetur haec ... in ea ...
mitur vere tempori interlapso: in opposito loco fit ...
scilicet additur, linea motus centri epicycli retrahitur in ...
ita hae centri epicycli lineae a pristinis multum dis...
... aliquot locis visis centri epicycli (nempe ...
... supponimus latere in eadem linea visoria ...
... operatione causae et mensurae inaequalitatis ...
... operationis a priori multum ... Nempe ...
... apogaeum, tempus fuerit imminutum, ...
... igitur eccentricitas aequantis minor. Et ...
... BZ, qui habet apogaeum, ...
... in parte minore reliqua, ...
... planeta redditus est in illa reliqua parte ...
... illam appropinquavit et apogaeum ...

[illegible] autem novae hypotheseos sic patebit. Quia tum demum [illegible] ponitur in lineam ductam ex Z centro epicycli per K [illegible] KZ est [illegible] continua tum $K\Sigma$ apparentia [illegible] Solis, [illegible] Z per [illegible] planeta [illegible] ducitur incedunt [illegible] pa- [illegible] jam [illegible] a Ptolemaeo, quo tempore [illegible] medii [illegible] KT per Ω ducta, planetam visum esse in linea $K\Omega$, ne- [illegible] epicycli simul esse in $K\Omega$, [illegible] ex [illegible] parallelos ex Ω loco planetae, quae sit ΩO [illegible] hoc [illegible] in linea [illegible] vel [illegible] qua huic [illegible] in linea KZ propior vel remotior [illegible] ipsi [illegible] puncto lineae KZ (quod jam [illegible] aliquo in ZK parallelos ipsi $K\Psi$, [illegible] $Z\Omega$ [illegible] aequalis ipsi $K\Sigma\Psi$, et $K\Sigma$ insensibiliter [illegible] ΩO, eo quod $K\Psi\Sigma$ rectus, et angulus [illegible] Z non major [illegible] $\Psi\Sigma$ 100000 talium $K\Sigma$ 100064) igitur et OZ [illegible] ipsa $K\Psi$. Connectantur Z, Δ, et ipsi $Z\Delta$ parallelos [illegible] ergo idem sit momentum temporis, quo [illegible] ponitur in Z, Mihi in O (quod in theoria [illegible] T [illegible]); idque momentum in theoria Martis [illegible] quia Δ est [illegible] aequalitatis [illegible] notabitur [illegible] novum igitur punctum aequalitatis, circa quod numera- [illegible] hac parallelo ex O.

[illegible] epicycli (secundum Ptolemaeum) in altera parte [illegible] eadem contingunt (quae omitto [illegible] parallelos ducitur lineae Ptolemaic[illegible] ergo novae duae paralleli concurrent in id [illegible] erit parallelos ipsi ZO vel [illegible] et aequalis [illegible] ipsi [illegible] et novum Δ erit commune [illegible] hypothesi.

[illegible] necessarium est, ut per Δ ipsi $K\Psi$ parallelos [illegible] ipsi [illegible], et connectatur novum Z cum K [illegible] prior Δ secabatur in Δ, [illegible] hoc [illegible] in priori hypothesi adhibeat [illegible] in [illegible] reliquis. Describes igitur ex [illegible] erit [illegible] planeta [illegible] aequalitatis [illegible]

[illegible]

circa perigaeum in Capricorno, continuata linea $M\Delta$ [illegible] in P, E. Nam quanta est $M\Delta$, tanta est et PE [illegible] signa[illegible] momentum idem per hanc unam [illegible] $M\Delta$, [illegible] Δ sit [illegible] aequalitatis, [illegible] versus [illegible] signabu[illegible] momentum idem: sintque ΔP, [illegible] et PE [illegible] tur N, Π.

[illegible] ubi maxima appareat haec discrepan[illegible] [illegible] Et certum, quod non in partibus epicycli ipsi K [illegible] [illegible] ent ipsi K [illegible] eandem [illegible] in summa [illegible] remo[illegible], ergo in proximis partibus [illegible] epicycli [illegible] hoc planeta non plane in perigae[illegible] (ut breviter dicam) in punctis [illegible] tempus [illegible] venientibus, per quae et K minimus [illegible] circelli centr[illegible] in linea per K ducta, quae continuata [illegible] cum linea $P\Delta$ itidem continuata angulum $7\frac{1}{2}$° [illegible]

Demonstrationem ex superioribus huc accommodes [illegible] nu[illegible] idem manent, nisi quod apud Ptolemaeum [illegible] [illegible] in numeris usurpatis $\mu\lambda$ (Fig. 52) [illegible] [illegible] bet $NK\Pi$ [illegible] [illegible] nempe [illegible] $\delta\beta$ ad $\delta\lambda$ [illegible] Ptolemaeo vero [illegible] ut K [illegible] [illegible] lis ipsi $\beta\varkappa$ ad $M\Delta$.

[illegible] eadem et in Tychonica hypothesi [illegible]

[illegible]



[illegible] in C Terra est, perinde [illegible] est, ut si [illegible] prima inaequalitas. [illegible] in lineam CV [illegible] (recto in linea CV; CG et oppositio) [illegible] in circulo VP, Sol in S et G, corpus [illegible] in theoria Martis eccentricitas planetae [illegible] [illegible] Tycho Brahe [illegible]

motrice ad eam respiciens seseque (ut qui orbe careat) [illegible] inci-
tans pro accessu suo vel recessu a Terra (nisi Terram Solis [illegible]
facere [illegible] hic vim Solis motricem transscribere velis), [illegible]
in Co[illegible]) vim motricem [illegible]tit ad [illegible] planetas, eos [illegible]
tans e[illegible]du celeritatis, q[illegible]nt illi [illegible] propinquitatis [illegible]
netae interim nituntur suos ad Solem accessus et recessus in [illegible]
conficere simulque Solem (quacunque is circa Terram concedit) [illegible]
giis insequi e[illegible]a ordinem, atque ita quilibet planeta [illegible]
simul respicit, ipsique planetarum trajectus per auram [illegible]
apud Ptolemaeum) spirales efficiuntur, qualiter capite I. [illegible]
inquam, an sint consentanea per [illegible] alibi expendemus [illegible]
tur vera haec forma hypotheseos in [illegible]ibus. Quaeritur, [illegible]
specie sit consentaneum, planetas insequi ipsum Solis corpus [illegible]
punctum V, P, corpore vacuum, quatuor semidiametris Solis [illegible]
centro Solis distans; quod jam supra Solem sit jam infra, [illegible]
pone: et amplius utrum magis consentaneum, vim, quae planetas [illegible]
Solem circumagit, in ipso corpore Solis S, G, an in tali aliquo [illegible]
cor[illegible] vacuo nidulari; breviter: si axis systematis planeta[illegible]
voci[illegible] a planeto de[illegible]cam), quo ceu clavo orbes pl[illegible]
annexi sunt, si hic [illegible]uam, est proxime Solem, cur non [illegible]
axis hic seu punct[illegible] affixionis circumit Terram et proxi[illegible]
plane tempore, cur propriam viam describit? cur non pl[illegible]
ite[illegible] observat? Omnino itaque concludo, siquidem [illegible]
sa[illegible] Tychonis Brahe sententia de systemate mundano [illegible]
dem[illegible] centrum systematis planetarum non in V, P, sed [illegible]
sim[illegible]olis it[illegible] versetur, denique [illegible] Sole [illegible]
seu eccentri [illegible]alitatem a secunda liberandam [illegible]
bus planetae [illegible] apparenti loco Solis, non [illegible]
[illegible]

Fig. 61.



[illegible] *quod momentum per* CV [illegible] *antecedit* [illegible] *in linea* CQ, *planeta, in qua apparitio* [illegible] *videbitur, et quia jam ponitur, in hoc casu* [illegible] [illegible], [illegible] QCI *erit linea una, hoc est, punctum a* [illegible] *erit in linea* CQ. *Quia igitur* CI *visio pla-* [illegible] *tempore est ultra* CO *visionem posteriorem,* [illegible] [illegible] *vergentem, erit igitur et* CQ *ultra* CV [illegible] Q [illegible] *ultra* V [illegible]. *Et cum* [illegible] CV *sit facta* IQ, [illegible] *angulo* OCI, *linea vero* [illegible] VD *vel* PD [illegible] *in* [illegible] *circulo* [illegible] *parallelos,* [illegible]

[illegible]

circumduxit, jam in circulum GS *transponimus,* [illegible] *corpus Solis, quod semper in linea, quae ipsi* CB *parallela* [illegible] *supra Braheanum punctum* [illegible] *stat, scilicet supra* [illegible]*: ut igitur* D *puncto aequalit*[illegible] *mente* [illegible] *scilicet* [illegible] *signatis) et planeta in* O [illegible]*ctum a*[illegible] *in* S [illegible] *per punctum* D *et* S *vel* G *novam lineam* [illegible] *demonstratis capitis V. (quae supra in explicatione* [illegible] *allegaveramus) ducta* DS *vel* DG, *et divisa in* [illegible] DP *vel* DV *per* L *est divisa, ut sit punctum divisionis* [illegible] *puncto* M, *intervallo vero quo prius, scribatur novus* [illegible] tantum reddet observationes has [illegible]teriores, ex quibus [illegible] immissus in priorem hypothesin, salvaturus est etiam [illegible] adhibitas intra praecisionem quinque scrupulorum.

Quae vero computationes instituentur extra situm [illegible] priorem et per novum hunc eccentricum, alicubi ([illegible] Solis) plus uno gradu dissidere poterunt, si numeros [illegible] Martis appropriatos per Braheum proditos sequamur.

Demonstrationem non est opus repetere. Delinea[illegible] schemate Copernicano (Fig. 59), si ex [illegible] Terra [illegible] gas, inque ea inter[illegible] centrum eccentrici Solis [illegible] centro eccentricum [illegible] Braheanum traducas per [illegible] Terrae Copernicanum.

Exposita igitur hac hypothesium diversitate [illegible] aequalitatibus aequipollentia, in secundis discrepantia[illegible] concludamus, [illegible] (si quid video) [illegible] opinionum [illegible] extricabiles et [illegible] aequivocatio[illegible] cumscriptione[illegible]iosissimas. Quae [illegible]

[illegible]

PARS SECUND[illegible].

[illegible]RTIS STELLAE INAEQUALITATE AD [illegible]TATIONEM VETERUM.

Caput VII.

[illegible] in theoriam Martis inciderim.

[illegible] vocem, quae discere jubeat homines astronomiam, [illegible] non verbis aut syllabis, sed re ipsa et commen[illegible] intellectus sensuumque, cum serie corporum et affectionum [illegible] etiam fatum quodpiam [illegible] homines alios ad [illegible] reddit, esse, ut p[illegible] creati operis, ita et [illegible]

[illegible] aetatem philosophiae dulcedinem cognoscere potui, [illegible] cupiditate [illegible] complexus, nihil admodum de astro[illegible] [illegible] Aderat quidem ingenium, nec difficulter [illegible] [illegible] ordo suppeditaba[illegible] [illegible]ebam, figuris [illegible] Sed erant illa [illegible]aria studia, [illegible] ad astronomiam [illegible] Cumque [illegible] sustentarer, viderem vero commilitones meos, [illegible] ad exteras nationes, mittebat, tergiversari varie [illegible] admodum meum conclusseram, quocunque [illegible] Prima se obtulit functio astronomica, ad quam [illegible] auctoritate praeceptorum; non [illegible] in aliis demonstraram [illegible], [illegible] functionis genere et tenuitate [illegible] in [illegible] edi[illegible] ingenio, quam [illegible] scientia, [illegible]

[illegible]

coepi. Cumque anno 1597 ad Tychonem Brahe scripsissem (I, 42), rogans ut suam de meo libello sententiam diceret, ipseque respondens inter cetera suarum etiam observationum meminisset, ingenti me cupiditate earum videndarum inflammavit. At vero Tycho Brahe, ipse quoque magna pars fati mei, ex eo non destitit me ultro hortari ut ad se venirem. Cumque me longinquitas loci esset absterritura, divinae rursum dispositioni adscribo, quod in Bohemiam is venit. Eo igitur veni sub initium anni 1600, spe planetarum correctas eccentricitates addiscendi. Cum autem primo octiduo didicissem, ipsum adhibere cum Ptolemaeo et Copernico medium motum Solis, esset vero apparens motus meo libello accommodatior (quod ex ipso libro patet), ab auctore impetravi, ut mihi liceret observationibus meo modo uti. Erat tum ejus domestico Christiano Severini [3*] sub manibus theoria Martis, quam tempus ipsi dabat in manus, eo quod versarentur in observatione acronychii situs seu oppositionis Martis cum Sole in 9° ♌. Si Christianus alium planetam tractasset, in eundem et ego incidissem.

Rursus ergo divina dispositione accidisse puto, quod eodem tempore ego advenerim, quo tempore Marti ille erat intentus, ex cujus motibus omnino necesse est nos in cognitionem astronomiae arcanorum venire aut ea perpetuo nescire. Recudebatur tabula mediarum oppositionum ab anno 1580, erat excogitata hypothesis, quae eas omnes repraesentare perhibebatur intra duorum scrupulorum propinquitatem in longitudine, cujus numeros vel paulo differentes capite V. usurpavi. Apogaeum initio anni 1585 ponebatur in 23° 45′ ♌, eccentricitas maxima, quae ex semidiametro utriusque circelli componitur, erat 20160, qualium semidiameter epicycli majoris esset 16380. Igitur in forma primae inaequalitatis Ptolemaica eccentricitas aequatorii puncti erat 20160 vel eo paulo minus. Ex hac hypothesi exstructa erat et tabula aequationum eccentri ad gradus singulos et correcti motus medii, additione facta ad Prutenicarum motum medium unius scrupuli et dodrantis. Et diducti erant hi motus medii, apogaei, itemque et nodi per annos 400, perinde ut in Solaribus et Lunaribus motibus tomo I. Progymnasmatum factum est. In sola latitudine sub acronychios situs itemque et in parallaxibus orbis annui Christianus haerebat. Aderat quidem hypothesis et tabella pro latitudinibus; sed non eruebatur inde latitudo observata. Quae res ipsi in Lunares motus incubituro impedimento erat. Cum igitur suspicarer id quod res erat, hypothesin non bene habere, accinxi me ipse ad opus secundum praeconceptas et in Mysterio meo Cosmographico expressas opiniones. Plurima sub initium erat inter nos concertatio, an posset alia institui ratio hypotheseos, quae tot loca planetae eccentrica ad unguem exprimeret? et an falsa esse posset illa, quae id hactenus per omnem zodiaci ambitum praestitisset?

Ostendi igitur ex iis, quae prima parte praemissa sunt, posse esse falsum eccentricum et tamen observationibus intra 5′ et propius respondere, dummodo verum sit punctum aequatorium. Quod vero parallaxes orbis annui attineret et latitudines, eam palmam adhuc in medio sitam nec dum obtentam ab illorum hypothesi: reliquum igitur esse, ut inquiratur an non alicubi per 5′ illi cum suo calculo ab observationibus dissideant.

Coepi igitur explorare operationis ipsorum certitudinem. Ex eo quinam fuerint in hoc labore successus, taediosum et inutile est repetere. Persequar autem ex hoc quadriennali labore illa tantum, quae ad cognitionem nostrae methodi pertinebant.

[illegible]	Planet locus	Lat.	[illegible]	Differentia	Medius locus ☉	Apogaeum	[illegible]	[illegible]
[illegible]	10 ♊	1. 40. 0 B.	6. 40. 10	4. 10 +	0. 27. 20. 40	3. 25. 21. 40	27. 56. 50	6. 56. 20
[illegible]	26 ♋	4. 16. 20 B.	16. 46. [illegible]	[illegible] 20 +	2. 1[illegible]. 34. 56	3. 25. 22. 17	28. 0. 38	16. 51. 26
[illegible]	[illegible] ♌	4. 23. 10 B.	21. 40. 26	0. 36 −	3. 22. 37. 45	3. 25. 22. 55	28. 2. 25	21. [illegible]. 41
[illegible]	10 ♍	3. 23. 12 B.	25. 10. 20	8. 10 −	5. [illegible]. 27. 46	3. 25. 23. 32	28. 4. 10	25. 4. 50
[illegible]	26 ♏	1. 6. 45 B.	[illegible]. 55. 10	[illegible] 35 −	6. 15. 53. 7	3. 25. 24. 10	28. 5. [illegible]	[illegible]. 57. 33
[illegible]	[illegible] ♐	3. 50. 0 M.	26. 32. 45	10. 20 +	[illegible] 7. 47. 30	3. 25. 2[illegible]. 48	26. 7. 47	30. 40. 33
[illegible]	[illegible] ♓	6. [illegible]. 0 M.	12. 40. 45	[illegible] 45 −	10. 10. 53. 50	3. 25. 25. 26	28. 9. 40	12. 34. 36
[illegible]	[illegible] ♉	0. 35. 15 B.	17. [illegible]	0. 12 +	0. 8. 26. 47	3. 25. 27. 35	28. 11. 27	17. 58. 14
[illegible]	[illegible] ♋	3. 33. 0 B.	2. [illegible]. 0	8. 0 +	1. 24. 55. 47	3. 25. 29. 5	28. 13. 30	2. 35. 10
[illegible]	[illegible] ♌	1. 30. 50 B.	[illegible]. 35. 0	0. 45 −	3. 6. 46. 16	3. 25. 30. 6	28. 15. 5	8. 19. 57

[illegible] Pataviensia Magino habita cum Gellio Sasceride Brahei discipulo. [illegible] observationem [illegible] (id est Brahei) Uraniburgi habitam.

Emendatio medii motus; long. ♂ inventa est ad [illegible] abundare a numeris calculi Prutenici sesquialtero [illegible] summum 1 ⁹/₆', quod rectius per omnia consentire [illegible] tunc apogaei ejusdem situs [illegible] ipso calculo eodem [illegible] ad primam stellam ♈ more Copernicano comparatis. [illegible] nostram ab illa stella aequinoctii verni in antecedentia [illegible] erat tunc 28° 2½', fuisse apogaeum ♂ in 23° 25' ♌ [illegible] in parte 23° 20' ♌, ultimo in 23° 45' ♌. [illegible]

Inventa quoque eccentricitas maxima, quae a[illegible] diametro componitur part. 20160, qualium semidiameter [illegible] sive distantia centrorum a Copernico usurpata 16380; [illegible] tam ab ipso quam a Ptolemaeo dissentit. Cautum, [illegible] refractione parallaxis adhibita Solaris. [illegible]

Examen mediorum motuum Solis instituemus ad [illegible] temporis aequalis, quot tabula profitetur. Est autem ill[illegible] in cujus opposito tabula ♂ stellam inventam dicit [illegible]

Anni	D.	Mens.	h.		Medius locus ☉			Visus locus stellae in ecliptica		Differentia	
1580	17	Nov.	9.	40	8.	6. 48.	32	46.	10	2.	[illegible]
[illegible]	28	Dec.	12.	18	9.	14. 50.	58	14.	16	4.	[illegible]
[illegible]	31	Jan.	[illegible]	35	10.	21. 10.	13	[illegible]	26	[illegible]	[illegible]
[illegible]	7	Mar.	[illegible]	[illegible]	11.	25. 5.	57	10.	36	4.	[illegible]
[illegible]	15	Apr.	12.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	10	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Quare ne sic quidem omnem confecerunt differentiam.

Porro de hoc ipsorum consilio disputabimus paulo post. Jam etiam medium motum ♂ examinabimus: cujus gratia vide sequentem tabellam.

[illegible]

Caput IX.

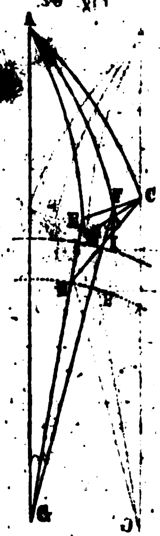
De reductione [illegible] ecliptici ad circulum [illegible]

Sed tempus est, ut de hac reductione ad eclipticam [illegible] quae fundamenti loco est, accurate disputemus.

Primum hoc nobis refert haec tabula ex observati[illegible] boream consurgere ab 18° ♉, in quo fuit 5', inde [illegible] post decrevisse et in 3° ♏ fuisse adhuc quidem 1[illegible] esse meridianam et valde magnam 4°; majorem [illegible] colligitur crassiori Minerva, nodum ascendentem esse [illegible] descendentem multo post 3° ♏. Ergo circa 17° ♉ et [illegible] circa 17° ♌ et ♒ limites. Itaque cum planum [illegible] clinatum ad planum eclipticae, accidet idem [illegible] rectis partium eclipticae, ut arcubus visis [illegible] de circulo altero respondeant, nisi qui a nodis incepti [illegible] Dico autem arcus visos, quia hic oportet [illegible] planetae, et perinde agere, ac si iter Martis [illegible] ecliptica, illamque v[illegible]caret. Et quidem cum [illegible] planetae eclipticus, [illegible]mi sic eum definiunt, esse [illegible] ticae, in quo circulus [illegible]titudinis (ad eclipticam [illegible]), planetae sub fixis transiens eclipticam secat. [illegible]

[illegible] Theodosii de Sphaeris [illegible] arcus [illegible] circul[illegible] si non per [illegible] Semper igitur major arcus est inter locum [illegible] propiorem, quam inter locum ejus eclipticum [illegible] planetas observamus, non prius nobis [illegible] finisse, nisi ad eclipticam eos retulerimus [illegible] [illegible] inveniatur circulus latitudinis per [illegible] [illegible]

Fig. 62.



[illegible], tunc esse planetam in opposito [illegible] planeta in G spectato. At tabulae [illegible] supra dictum est, planetam non [illegible] opposito, nisi ipsi AC (visibili [illegible] modo) aequetur arcus AB, elongatio [illegible] eodem modo.

[illegible]. Spectatur quidem tunc planeta [illegible], et non est: et commoditas, quam [illegible] cum Sole quaerimus, plus vitiatur [illegible] AB, quam ipsi sperabant, eam [illegible] observantur planetae in Solis [illegible] et careant tamen inaequalitate se- [illegible] opposito Solis in B et planeta [illegible] inter nodos et limites, planeta plus [illegible] secunda longitudinis, quam si oppo- [illegible] planeta in C. Sit enim [illegible] planetarii, in quo omnes orbes [illegible] vel in Copernicana vel Brahaeana [illegible] G cum A et E punctis eclipticae; [illegible] in puncto H [illegible] [illegible] puncto H spectatum G [illegible] in opposito ipsius E, [illegible] H spectetur in C loco suo sub fixis in linea HC. [illegible] in linea HC. Est vero multo in- [illegible] HC [illegible] et ex G per [illegible] ducatur recta, [illegible] planum [illegible] est sub arcu EC, [illegible] ducatur tertius arcus AF, [illegible] H [illegible] G [illegible] AF [illegible] Solis opposito in E [illegible] in B [illegible] sub [illegible] AD [illegible] Solis plus ab A removetur [illegible] ab ipsis [illegible] Sol [illegible] [illegible] AC aequalis [illegible] AD [illegible]

Fig. 62.



Secundo igitur hoc desidero, [illegible] rationem non bonam secuti sunt. [illegible] ecliptico et EC latitudine visa, [illegible] longitudinem et posuerunt, tunc [illegible] quantitate AC a nodo removeri [illegible] (cujus primam inaequalitatem investiga[illegible] sed sub AD, ut jam ostensum. Nihil [illegible] AC ad inaequalitatem primam, sed [illegible] elongationes ab A. Etenim visa [illegible] autem puncti F latitudo, seu inclinatio [illegible] ticam, est EGF. Itaque etsi secunda [illegible] dinis absorbetur in oppositione cum Sole [illegible] inaequalitas secunda tunc est fere maxima [illegible] est HIG angulus. Quemadmodum igitur [illegible] efficit, ut AC longior sit quam AE [illegible] hujus latitudinis visae FC vel HG, [illegible] tate secunda, efficit, ut eadem AC [illegible] longior igitur justo. Atque hoc [illegible] potest; excurrit enim ad 3'. [illegible]

[illegible] quem tribuerunt [illegible] non manet constans. [illegible] additionem tabula exprimit [illegible] EC computatae EAC [illegible] subjecta tabella [illegible]

4. 58 [illegible]
4. 35 [illegible]
4. 0 [illegible]
5. 28 [illegible]
6. 20 [illegible]

Caput X.

[illegible] observationum, ex quibus [illegible] Tycho [illegible] momenta oppositionum cum medio So[illegible]

[illegible] in tam subtili inquisitione, quin ipsa funda-
[illegible] Et copiam mihi fecerat Brahaeus [illegible]
[illegible] inveni.
[illegible] 12. Novembris hora 10. minut. 50. reponebant ♂ in
[illegible] variationum horizontalium, quo nomine paral-
[illegible] in sequentibus intellectas volo. Haec igitur
[illegible] et solitaria. Reducta fuit ad articulum oppositionis
[illegible] ex Prutenicis. Nam in Maestline die 12. in [illegible]
[illegible] 20′ ♊; die 17. rursum in meridie in 6°. 25′ ♊. Ergo
[illegible] 1°. 55′. In Stadio [illegible] 1°. 52′. Itaque
[illegible] 50′ Mars debuit videri vel in 6° 41′ 50″ ♊ vel in
[illegible] 46′ (quam Tycho ponit articulum observationis) per
[illegible] vel in 6° 42′ 54″ vel in 6° 45′ 54″. Robuit
[illegible] oppositionem (quod scrupulositatem attinet) esse
[illegible] observatio, sed aliunde mutato
[illegible] hos 5 dies tribus scrupulis a se ipso
[illegible]
[illegible] Dec. h. 11½ reponebant ♂ in 16° 47′ [illegible] ex ob-
[illegible] 46′ postea momentum oppositionis a Tychone designa-
[illegible] scrupulum [illegible] Ponit igitur Tycho
[illegible] adjecta schedae [illegible] correctio per refractio-
[illegible] rudimentum nascentis tunc opinionis de refractio-
[illegible] locum observatum [illegible] quare non conside-
[illegible] permutet [illegible] erat, [illegible]
[illegible] medio coeli, ubi in [illegible] longitudinis parallax[illegible]
[illegible]
[illegible] h. 12 [illegible] ♂ in 21°. 18′ 11″ ♌ e[illegible]
[illegible]

sunt ad momentum assignatum d. 2. h. 4. 5'. Et [illegible]
promoveri per 1° 12' 47". Competunt igitur diebus 2 [illegible]
Itaque ad momentum ♂ in 26° 35' 31" ♐. Variatio[illegible]
longum non [illegible] opus, quia ♂ in M. C. et initio ♑. [illegible]

VII. Anno 1593 d. 24. Aug. h. 10. 30' rel[illegible]
cum diurno 16' 45" observato, itaque circa [illegible]
longitudinis nulla. Praecesserat momentum oppositi[illegible]
8. 17' (erat enim h. 2. 13'), quibus competit motus [illegible]
Itaque in 12° 43' 48" ♓ cadit planeta. Et tabula [illegible]

VIII. Anno 1595 d. 30. Oct. h. 8. 20' [illegible]
cum diurno 22' 54". Praecessit momentum assignatum [illegible]
quibus debetur motus ♂ 2' 7" in consequentia, ut [illegible]
[illegible] projectus erat in orientem ob parallaxin. [illegible]
meridiana observatione ponunt in tabula 17° 53' [illegible]

IX. Anno 1597 d. 10. Dec. h. 8. 30' [illegible]
[illegible] in 4° 1' ♋: quorum medium [illegible]
momentum oppositionis post dies 3. h. 5. [illegible]
1° 15' in antecedentia. Ergo fuisset ♂ in 2° 30' [illegible]
reponitur in tabula [illegible]
[illegible] Excesserat Tycho [illegible]
neque tamen [illegible]
mansisset hactenus. Eximia enim erat huius [illegible]

[illegible]

Caput XI.

De parallaxibus diurnis stellae Martis.

[illegible] et restitutionis motuum inde [illegible] jam cessavi. [illegible] patet, assumenda quidem loca ♂ sub oppositionem [illegible], sed tamen [illegible] inaequalitatem [illegible] ut arcus in ecliptica numeratus reducatur ad orbitam [illegible] planetae prius est investiganda per inclinationem plano- [illegible] cognitionem. Rursum inclinatio et nodi nequeunt sine [illegible] siquidem haec sit granduscula. A parallaxi igitur [illegible] inquirendae modos duos posui. [illegible] (ortus et occasus) examinabitur in observationibus [illegible] 1582 [illegible] ♂ opponeretur ☉ in [illegible] incredibilem [illegible] titulo Tychonis manuscripto [illegible] ex qua aut plane nullam aut perexiguam [illegible] quod (more solito) stellam ♂ [illegible] plerumque longe distantes. Cum igitur [illegible] parallaxis stellae [illegible] motu retrogrado), hinc factum, ut fere [illegible] ♂ fuerit observatus. Cujus enim [illegible] quippe quam est ♂ [illegible] ecliptica [illegible] versante) aut [illegible] ob refractionem [illegible] perm[illegible]tentur, semper minor fides [illegible] negotio, quam si [illegible]

[illegible] ♂ notabiliter majorem Solari, [illegible] ut [illegible]

8. 28′ distabat ab oculo ♉ 44° 41′, cujus latitudo 5° [illegible]
4° 12½′ ♊ anno 1600. Hinc ♂ longitudo quasi anno 1600 [illegible]
hoc est completo 1582. 17° 38′ ♋; altitudo 40° 50′ [illegible]
igitur.

Vicissim h. 7. 15′ matutina diei 27. Dec. distabat [illegible]
cujus latitudo 0° 26½′; hinc ejus longitudo 1582 compl[illegible]
altitudo 14° 4′, in refractione igitur. Ab hora [illegible]
horam 19. 15′ per horas 10. 46½′ visus est retrocedere [illegible]

Pro diurno, notata die 29. h. 7. 47′ distantia ♂ a [illegible]
australi 29° 38½′. Die vero 30. h. 8. 8′ distantia ab eadem [illegible]
Igitur horis 24. 21′ mutata est per 25′. Atqui hic [illegible]
die 27. Horis ergo 10. 46½′ debebantur 11½′ [illegible]
Hoc expendamus. Parallaxis vesperi praecedente [illegible]
taliorem (quia retrogradus) projicit in ortum, mane cadentem [illegible]
[illegible]liorem projicit in occasum. Sicut igitur parallaxis [illegible]
[illegible] ad visum [illegible] parallaxis [illegible]
accelerat. Si ergo sentitur parallaxis, per [illegible]
[illegible] At hic diminutus est motus. [illegible]
vera contraria parallaxi refractio [illegible]
13° 4′ [illegible]
[illegible]
[illegible]
[illegible] 12⅔′ [illegible] horarum 10½ [illegible]
parallaxi [illegible] debuit esse 11½′ [illegible]
[illegible]
et [illegible] permutatur, sentitur minor [illegible]

Die 16. Jan. anni 1583 vesperi hora 7. 30′ ♂ [illegible]
[illegible]

[illegible] *distantiam* ♂ *ab hac stella accipio, quia cursus* [illegible] *ut mane et vesperi distantia* [illegible] *parallaxin* [illegible] transscribere volui, ut lector certum [illegible], Braheo [illegible]

[illegible] 8. 52′ inter ♂ et cor ♌ 44° 22′ [illegible] Mane hora [illegible] 44° 27½′. Motus ergo horarum 7. [illegible] Se- [illegible] 7. 3′ fuit haec distantia 44° 32½′. Horarum igitur [illegible] 10½′. Et horis 8 debentur minus quam 4′. Lucramur [illegible] 1½′.

[illegible] ad diem 17. Jan. quantum debuerit esse aug- [illegible] ex parallaxi majori quam Solaris usitate creditur. [illegible] parallaxin Solis esse 3′, habeat Mars 4′.

[illegible]	♄ 5.	20		[illegible] 5.	0
	7.	22 ♒		7.	31 ♒
	309.	47.		309.	56.
	79.	0.		225.	0.
[illegible]	28.	47.		174.	56.
	0.	56. ♉		24.	20. [illegible]
	11.	50.		2.	12.
	118.	47.		264.	56.
	19.	41. ♌		26.	0. ♒
	19.	41. ♉		26.	0. ♌
[illegible]	18.	45.		28.	29.
[illegible]	44.	5.		53.	43. *Ergo*
	40.	40.		47.	41. *hoc est*
	49.	20.		42.	19.
	2.	36″		2.	58″
	10.	0. ♋		10.	0. ♋ *ergo*
	50.	19		46.	0
[illegible]	2.	0″ *in circum*		2.	8″ *parall. in circum.*

[illegible] Videri majorem [illegible] [illegible] igitur [illegible] Ergo [illegible]

[illegible]

idque in ♎, quare ab exorta ♂ usque in ipsam ... decrescit angulus horizontis cum ecliptica. Itaque ... nomine Opticae parallaxis, si qua est latitudinis, ... cremento ve... per parallacticas columnas, e regione ... eclipticae cum horizonte quaesito, cognoscitur in ... tota horizontalis.

Sequitur series mearum observat...

Nocte inter dies Jovis et Veneris, qui fuere ... Corvus coelum mediat, erat inter ♂ et Spicam 9° ... Lancem boream 17° 41', inter ♂ et Arcturum 29° ... baretur sextans, mensi sumus etiam, quod ... 32° 57', quod tamen debuit esse 33° 1' 45", ut pate... tur adhibitis seu ascensio... rectis et declinationib... latitudinibus, quas assignavit Tycho sideribus hisce ... Ergo distantiae m... minores justo fuere ... fixis distantias, ut fuerit a Spica 9° 48' 45", ... ab Arcturo 29° 17' 45".

Sumsi autem et altitudinem ♂ meridianam ... et Spicae 30° 50', quae cum habeat declinationem 9° ... declinatio. Ostendebat autem altitudo Spicae, ne... perpendiculum, nam altitudo aequatoris est in ... meridiana Spicae 30° 52', ... 32° 6'. Ex declin... a fixa prodiit ejus asc. recta:

a Spica	20...
a Lance	200...
Differentia	0...
Medium ergo	20...

Nam certus non sum ... [illegible]

[illegible] Et tunc altitudo ♂ erat 11°. Post culminavit [illegible] contento perpendiculo. [illegible] igitur alti[illegible] proxime. Eo articulo altitudo [illegible] erat 23°. [illegible] distantiam priorem, quae prodebatur [illegible] 19, 13, [illegible] prius erat 13½, 14, 10, 12 [illegible]
[illegible] horizonti vicinum primum attollebat [illegible] Arcturo [illegible] altitudinem aliquam acquirente. Sed [illegible] in observando, frigus et penetrantissimi venti [illegible] ferrum tractari, claudi trochlea nequibat, [illegible] non [illegible] quo ad minutum notaretur. Vindemiatrix altitudinem [illegible] in meridiano 53° 5′ paulo auctiorem justo, sed Spica [illegible] justam. Martis culminantis altitudo 32° 6′ [illegible] Arcturi 61° 13′ justa. Hinc distantia Martis [illegible] Arcturi [illegible] Cum in [illegible] hoc tempora Mars statio[illegible] [illegible] Pratebico et meo calcu[illegible] [illegible] in ecliptica potuit mutari in altitudine m[illegible] [illegible] (nam de uno scrupulo [illegible]) altitudo meridiana, neque latitudi[illegible]
[illegible]

[illegible] Martii probavimus sextantem, [illegible] superius [illegible] inter [illegible] minorem et superiorem [illegible] 26° [illegible] 15′. Sic inter eandem [illegible] 22½, quam Tycho in epistolis [illegible] culminaret [illegible] regula [illegible] Arcturus et [illegible] 29° 13½′ [illegible] 29° 15′ [illegible] Secuta [illegible] Martii [illegible] Arcturus [illegible] regula [illegible] 29° 13′ [illegible] videbatur tamen [illegible] aliquid [illegible] Perfecta observatione [illegible] Jupiter Saturnus [illegible] 20 Februarii 10 Martii [illegible] inter 29° 9′ et 29° 10′ [illegible]
[illegible] At paulo post [illegible] videbatur enim 29° [illegible]
[illegible]

examen jubet), exactissime coincidet eritque [illegible] 7' 35½'; quare locus 26° 18' 48" ♎; latitudo 2° [illegible] fuste latitudinem eandem, cum interim planeta 38' [illegible] Quodsi per hunc inventum locum ♂ inquiras [illegible] prodibit 29° 9⅙' et in vitioso instrumento 29° 14' [illegible] culminasset, distantia nostra (sed jam luxato et [illegible] fuit [illegible] 13½'. Rursum igitur sextantem probavi [illegible] et [illegible] Cygni exhibuit 44° 45'; sed debuit esse [illegible] stina instrumenti conditio. Cum jam ♄ uno gradu [illegible] non tolerari potuit 29° 13½'; plus tamen erat quam [illegible] 29° [illegible].

Haec igitur observationum series, ex quibus [illegible] tilissime [illegible] extruere nitar. Itaque non argutioribus [illegible] diligentiori et feliciori. Sp[illegible] etiam lectores [illegible] [illegible] expetituros Tychonicas certissimas. Sed [illegible]

[illegible] Primus et secundus dies tantum ad probandum [illegible] concurrunt. Utrinque ♂ ab Arcturo distitit [illegible] [illegible] 32° 7' vel 6'. Me vero exercuere illi [illegible] [illegible]ndos, si necessaria instrumenta fuissent. [illegible]

At 3. Martii, cum se Leonis [illegible] cor Scorpii, 29° 19' plus. Ergo [illegible] per 4½' circiter. Et cum Arcturus et [illegible] [illegible] arguit igitur haec distantia [illegible] [illegible] Non ignoro, 29° 19' parum [illegible] [illegible] antecedentis debere esse [illegible] Marte. Scio etiam, cum est [illegible] obnoxium [illegible] refractionibus. [illegible]

[illegible]

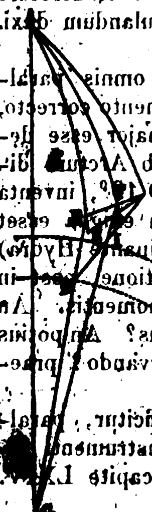
[illegible] plus varies Martis latitudinem, quam hanc ab Arcturo [illegible] et perexiguam in majori metu dissimulandum duxi. [illegible] instructus est.

[illegible] nihil aliud videtur agi, quam destrui omnis paral[illegible] meridiano debuit esse 29° 9½' instrumento correcto, [illegible] At inventa 29° 13½' ultimo, cum major esse de[illegible] (si qua esset) et per hanc major ab Arcturo di[illegible] tempore, quo ♂ ad altitudinem venit 19°, inventa [illegible] scrupulo auctior in fine: quae admodum exigua esset [illegible] haec valet? Cum esset altus 9° (culminante Hydra) [illegible] vitioso instrumento, et tamen in refractione, post in [illegible] rursum 29° 9', idque bis diversis momentis. An [illegible] potuit inito, ut constans idem manserit arcus? An potius [illegible] viderer diligentissimus, erasse observando? prae[illegible]

[illegible] quibuscunque observationibus certum efficitur, paral[illegible] non fuisse majores 4', quantum instrumenti [illegible], valde exiguas esse. Infra capite LX[illegible]. [illegible]

[illegible] Martis majores parallaxibus Solis, hypotheseos Ty[illegible] argui, ex qua facile Martis parallaxes computari [illegible] certi essemus. An igitur incerta est ratio Solis [illegible] ex eclipsibus indagare? Omnino, quod quantita[illegible] ipsam attinet, certissima. Non est Sol [illegible] Terra, non tamen infinitis semidiametris abest. [illegible] semidiametros (quarum autumarum illa in Mysterio [illegible] observationibus eclipsium pro [illegible] citius et [illegible] certus aliquis numerus demonstratus [illegible] probabo.

Fig. 62.



Igitur in CEA *rectangulo (ubi* CEA [illegible] *enim nullius est momenti in hoc* [illegible] *et angulo* EAC *inquiretur longitudo* [illegible] *ecliptici a nodo.* Haec operatio nihil [illegible] est et propinqua nodo. Demonstratio [illegible] mendat aliam. *Dictum enim est* [illegible] *non esse constantem, unde pro diversa* [illegible] *sitionum latitudines diversa etiam* [illegible] *Neque enim* EAC *tam est magnus* [illegible] *maxima nisi, quia* AC [illegible] AC, *sed interior aliqua (puta* AE) [illegible] *ex centro Solis videretur:* [illegible] *in hac quidem operatione* [illegible]

Aliter igitur ex nodo [illegible] observationibus ad diem [illegible] dus etsi jam quibusdam praeceptis [illegible] constius tractabitur parte quinta, [illegible] solum praelibanda est. Praesupp[illegible] neta vere motuque eccentrico [illegible] Terrae vel Solis fieri [illegible]

Nam in hypothesi [illegible] [illegible] [illegible] In hypothesi [illegible] [illegible]

[illegible]

I. Anno 1590 d. 4. Martii [illegible] sept., ascensio recta 22° 35′ 10″. Hinc [illegible] latitudo meridiana 3′ 12″: parallaxi et [illegible] facientibus ideoque neglectis. [illegible]

II. Anno 1592 d. 23. Jan. [illegible] 0° 2′ merid., altitudo [illegible]

[illegible]

[illegible] observatus. [illegible] 687 [illegible] qui [illegible] in ipso nocte fuit observatus. [illegible] idem [illegible] 1590, cum die antecedente quarto habuisset [illegible], quam intra quatriduum reliquum confecit [illegible]

[illegible] nihil referre, ubi Terra sit, vel [illegible] nihil referre in Ptolemaica, ubi Sol sit respectu [illegible] Martis in epicyclo: nihil in Tychonica, ubi centrum [illegible] respectu lineae ex Marte per Terram, ut in [illegible]: esse enim semper eandem diametrum nodorum [illegible], semper sibi parallelon in Tychone: nisi [illegible] nodi parumper transportantur; qui motus intra [illegible].

[illegible] nodum quaeramus. [illegible] observaretur hora 7. 10 in [illegible] fuit ejus latitudo in 0. 3. 46 [illegible] Parallaxis est parva [illegible] distans [illegible] Refractio contra est magna: ex [illegible] Solis 11 [illegible] Itaque vere [illegible] scrupulis [illegible] per refractiones Solis [illegible] Est igitur [illegible]

16° 48′ ♉, hic 15° 44½′ ♏, loca ♉ eccentrica [illegible] fere ex centro systematis planetarii sunt opposita [illegible] quod Ptolemaeus Terram, Copernicus et Tycho [illegible] xime Solem dixerunt.

Quantum autem mutaturi simus in his locis [illegible] theoria Solis a medio ad apparentem motum Solis [illegible] infra parte quinta patebit.

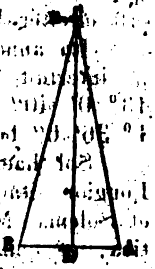
Caput XIII.

Investigatio inclinationis planorum eclipticae et [illegible]

Nodis et limitibus superiori capite ex sententia [illegible] proxime inventis, jam etiam inquirendum est, quantum [illegible] orbitae Martis ad planum eclipticae. [illegible] deducere non ita promtum est. Nam angulus [illegible] apud centrum systematis planetarii, quod Copernico [illegible]

At visus in Solem nunquam [illegible] [illegible]

... quae in dispositione ♂ aequaliter abest) Fig. 84.
... quod, quando lineae ex C ♂ et A ♁ in B
... angulum CBA, tam CB brevior
... oportet BA locum oppositum ☉ et BC
... distare 90°, et CAB, CBA
... BC in 17° ♌ vergente, ☉ oportet esse
... 17° ... Contra si BC sit in 17° ♒,
... 17° ♏ et ante 17° ♉, quibus circum-
... designantur matutini exortus vel vesper-
... sextiles vel quintiles ♂ et ☉.



... si C Terra sit, A centrum epicycli,
... poterit esse rectus, ut CA, CB fiant aequales. Itaque
... oportet esse majorem 90° vel minorem 270°.
... paulo cupis agere, assume ex Copernico vel anti-
... proportionem orbium ♂ et ♁ [in Copernico],
... eccentrici et epicycli [in Ptolemaeo] crassa
... 1000, et eam in 16, 17° ♌ ut 5 ad 3, in 16, 17° ♒

... *ACB sit isosceles, et* AC, CB *utrına aequalia,*
... BC *ducta in* 17° ♌ *est* 1666⅔: *qualium ergo*
... AD *dimidia de* AB *est* 1000, *erit* AC
... *quaesita refert* CAD *vel* CBD *angulos*
... 16, 17° ♒, *qualium* AB 1000, *est* AC 1375, *et qua-*
... 2750, *exhibens in tabula secantium angulum* 68° 40′.
... *in* 16, 17° ♌ *vel circa, oportet* AC *... locum*
... 72⅔ *vel illa* BC *in* 16, 17° ♒ *versante*
... (CAB, CBA) *in* 17° ♌
... 35° *in* 17° ♌. *Quare per lineam* AC ♁ *vel*
... *vel in* 12° ♋ (*Sole in* 90° ♈ *versante*)
... *summa* (CAB, CBA) *est* 137⅓°
... AC *vel in* 24⅔° ♐ (*Sole per* AB
... (*Sole in* ... ♊ *versante*) *spectari oportet.*)

... anno Nova anno 1580 vel 1588. Alterum
... 1582. Tertium Sept. vel Oct. 1587, 1589,
... 1591, 1592, 1595, 1597. Ad ultimum casum
... boreali ... ascensionem
... observatam ... videri
... ♂ in
... 121 ...

ipso limite. Quare tollentibus se mutuo quatuor [illegible] erit circiter 1° 50′. [illegible]

Ita anno 1586 d. 22 Oct. mane [illegible] ☊ interfuit 6° [illegible] in consequentia. [illegible] 13° 0′ 40″ bor. Hinc invenitur ejus [illegible] 1° 36′ 8″ bor. [illegible]

Sol haerebat in 8° ♏, distans 68 a [illegible] Longior itaque linea inter Martem et Terram [illegible] et Solem. Minor itaque visa latitudo digressione [illegible] ties, et quidem longe ante limitem. Die vero [illegible] (☉ versante in 19⅔° ♏) ♂ visus est in 5° 52′ [illegible] Distat Sol a Marte per 78½° pene justo modulo. [illegible] boream aliquot gradibus, circiter 16° 47′ [illegible] latitudo apparuit. Sed et in ipso limite [illegible] 1° 50′ circiter. Sequenti 1. Dec. mane [illegible] cor ☊ et ♂ fuit 25° [illegible] cum declinatione [illegible] longitudo 20° 4′ 30″ ♏ latitudo [illegible] a Marte; debuit tantum 72½°. Quare minor est [illegible] et Terram, quam inter Martem et Solem. [illegible] major apparuit quam erat re vera. [illegible] eclipticae quam 2° 46′ [illegible] et multo quidem [illegible] quam 1° 27′. Hic igitur [illegible] major eminus. [illegible]

[illegible] Vide vero anno 1588 [illegible] inter Martem et [illegible] interesse 20 [illegible] Hinc invenitur locus [illegible] erat in 11 [illegible] est ♂ [illegible] Sol [illegible] major [illegible] 10″ [illegible] contracta [illegible]

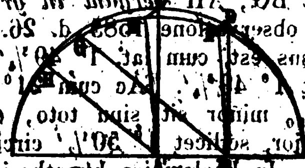
Sic [illegible] 1590 [illegible] 11° 49′ [illegible] bor. [illegible]

... maxima quum 1° 30′ et dimino proxime ... latitudo, scilicet 1° 30′ crescat, ... quae praesupponitur mediocriter nota orbium ... citra calculum sequebantur, satis prompte ... planorum indicantes.

... cum selectioribus et rarioribus observationibus ... jam sine ulla praeconceptione proportionis ... nobis proditur, nullo etiam calculi labore implicitum.

... mutuo secant, quaecunque binae lineae ad idem punctum ... utroque plano ducuntur, rectae ad sectionis lineam, unum ... concludunt.

... ACDB, orbitae Martis planum AEFD, ... et Sol in A, Terra in ... ad rectos stabuntur ... AC, BD, in orbita Martis ... in F. Erit ... E ... FBD. Vide igitur ... Sole in 16, 17 ... accidat perfecta qua- ... BA ... hoc ... et linea ... planorum est) ... per Martem ... quadrantem ... FBD, tanta erit et inclinatio planorum ... loci in F ... ab ecliptica digre- ...



... 22. Aprilis anno 1585, quem etiam jam ... in 11° ... vel ... infra nodum. Terra igitur ... Quo nomine major justo fiet lati- ... propinquiore loco. At contra, cum non intersint ... hoc nomine rursum minor justo erit haec ... contrariae illae exorbitationes se mutuo ... proxime ... visam latitudinem. Vide ... tanta planorum inclinatio.

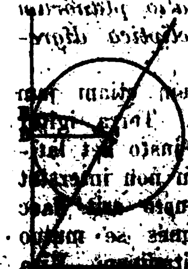
... erat ... Sed nulla observatio ...

Sol in 2½° ♏ supra nodum. Terra ergo infra [illegible]
Itaque ex appropinquatione major fuit visa latitudo [illegible]
ecliptici. Post dies 14 Sole in nodum competente [illegible]
(quantum imminuta est praecedentibus) 14 diebus [illegible]
non manet proportio eadem imminutionis. Terra discedente [illegible]
a Terra. Semper enim in remotioribus minor est [illegible]
hinc contra inclinationem maximam 1° 50′ deprompi [illegible]
eminus confirmatur.

Demonstratio latius extendi potest. *Sit* (Fig. 65) [illegible]
per corpus Solis ducta in locum nodi 17° ♏ *vel* ♉ [illegible]
quocunque zodiaci loco. Latitudo igitur, quam [illegible]
inclinationem puncti de plano, tantum vere distantia [illegible]
♂ *abesse videtur a* [illegible]*nite. Spectetur* ♂ *in* BG. [illegible]
Quanta igitur apparet latitudo in G *ex* B, *tanta est* [illegible]
Et BG, AH *vergunt in gradum eundem sub* [illegible]
in observatione 1585 d. 26. Apr., quia ☉ in 16 [illegible]
visus est, cum lat. 1° 49½′, ergo inclinatio in 2 [illegible]
est 1° 49½′. Ac cum 21° 26′ ♀ abeit a limite [illegible]
½₆₀ minor sit sinu toto, erit et hic maxima [illegible]
major, scilicet 1° 50½′ circiter.

In Ptolemaica hypothesi demonstratio hujus rei [illegible]

Sit A Terra, AB linea per Solem, et ejus [illegible]
AD linea visionis Martis, D ♂ [illegible]
Fig. 66. AD in 17° ♀ vel ♎. Et quia [illegible]
exit paralleles ipsi BA (quia [illegible]
motum Solis in suo orbe sequitur) [illegible]
transibit. Sit in AD, E punctum [illegible]
AE. Itaque, quia EC non [illegible]
etiam tantum ab ecliptica [illegible]



[illegible]

[illegible] in partem quintam et caput LXIII, nec hic est [illegible]

[illegible] oppositionum Tychonis fuit latitudo visa in 21° 16′ ♌; [illegible] Sol, B Terra, C Mars in eccentrico. Ergo linea AE [illegible] inter fixas excurrens incidet in eclipticam, AC in [illegible]. Et cum ♂ sit in 21° ♌ proxima limitem, angulus [illegible] erit maximus. Quem sic investigo. Sit BA 1000, [illegible] EBC 4° 32½′. Ut ergo AC ad sin. EBC sic BA [illegible] 2° 43′ 27″ qui ablatus ab EBC, relinquit angulum [illegible] 1° 48′ 43″, qui in ipso limite esset hinc circiter [illegible] variatur, si proportio BA ad AC variatur, de [illegible] modo ex quacunque acronychia observatione, cujus [illegible] sit, inquiritur primum inclinatio illius puncti [illegible] maxima, consideratione distantiae a nodo vel [illegible] 1593 d. 24. Aug. latitudo visa sub oppositionem [illegible] 6° 7′ meridiana, ♂ in 12½° ♓. Sit igitur BA [illegible] anticipata. Ut igitur CA ad sinum CBE sic [illegible] BCA 4° 21′ 10″, qui ablatus a CBE relinquit BAC [illegible] 10″.[11]) Abest vero locus iste 26° circiter a limite, [illegible] igitur sinus 64° ad hanc digressionem ab ecliptica [illegible] ad maximam planorum inclinationem, quae prodit [illegible] tribus scrupulis non est ut simus solliciti: pendent [illegible] proportione, de qua infra parte quarta.

[illegible] ptolemaica, erit A Terra, C centrum epicycli Martis, D [illegible] epicycli, eo quod Mars in oppositione Solis versatur. [illegible] Solis linea in ecliptica est, planum vero epicycli [illegible] erit CD parallelos ipsi EA. Ergo BAC et ACD [illegible] eccentrici et epicycli. Sed et aequalis est CD [illegible] hypothesium aequipollentiam, vel certe ut in Copernicana [illegible] epicycli Ptolemaici semidiameter DC ad CA lineam [illegible] epicycli. Ergo et CDA, CBA aequales, et EBC, BAD [illegible]

Fig. 67.



[illegible] (pe[illegible]
dibus) contingere conjunctionem Martis et Solis, quae [illegible]
per corpus? Quod si verum sit, frustra [illegible]
confinxerit, ne corporalibus conjunctionibus crebro contingen[illegible]
exagitationes [illegible] virtutum [illegible]

Copernicus, divitiarum suarum ipse ignarus, [illegible]
dum omnino [illegible] non [illegible] naturam, sed quam [illegible]
accesserat. Qua de re lege Rheticum in Narratione. [illegible]
appropinquationibus Telluris ad sidera latitudinem speciem [illegible]
ausus est, residuas latitudinum augmenta Ptolemaica [illegible]
quatio Telluris non assequeretur, rejicere, sed [illegible]
nes planetarum eccentricorum [illegible] quibus inclina[illegible]
maeo constans et fixus variaretur, atque id quod [illegible]
ad leges motuum eccentrici proprii, sed Telluris [illegible]
Copernicum libro VI. cap. [illegible]

Cum hac impertinenti diversorum orbium [illegible]
credulitatis [illegible] semper pugnavi, [illegible]
Tychonis. [illegible] mihi gratior observationes [illegible]
[illegible] aliis praeconceptis opinionibus.

[illegible] quis [illegible] derogat [illegible]
praejudicia [illegible] demonstravi [illegible]
[illegible] Prius [illegible]
maximae propositis, [illegible] Sol [illegible]
hic, [illegible] conjunctioni Martis, [illegible]
vari expedite potest, [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
probabitur, constantem esse declinationem [illegible]

Itaque hoc firmissimis consolidamus, [illegible]
corum ad eclipticam (cur enim [illegible]
planetae [illegible] habet? [illegible]
[illegible]

Caput XV.

85' 31''. Ut autem 1° 25' 31'' ad horas 24, sic [illegible]
17. 46'', quibus de motu Martis respondent 18' [illegible]
30. Jan. h. 19. 14'. Locus Martis in ecliptica 21° 36' [illegible]
ductione minimum aliquid subtrahitur, quia Mars jam [illegible]
Itaque extensio arcus orbitae a nodo sequente vergit in antecedentia [illegible]
quia tantum 4 aut 5° abest Mars a nodo, plane insensibilis [illegible]
tractio. Latitudo ex fide tabulae Tychonicae 4° 32' 10'' bor. [illegible]
vatio die 31. Jan. h. 12. dedit 4° 31'. Residuum Tychoni [illegible]
parallaxin diurnam.

IV. Anno 1587 nocte quae sequebatur quartum Martii [illegible]
post mediam noctem inventus est locus Martis ex corde [illegible]
26° 26' 17'' ♍, cum lat. visa 3° 38' 16'' bor. Quia vero Mars [illegible]
tar 37 ½° supra horizontem, parallaxis diurna considerand[illegible]
longitudini parum aliquid, ut hoc nomine planeta sit in [illegible]
latitudine paulo majore. Nam quia Sol pene duplo [illegible]
quod Mars ab ea distat, pene itaque duplo major [illegible]
quam Solis, et posita Solis 3', Martis fiet 5' circiter [illegible]
distat nonagesimus a vertice 55°, e quorum regione sub [illegible]
lactica nostra exhibetur latitudinis parallaxis 4' [illegible]
Itaque latitudo ex centro Terrae visa fuisset 3° 42' 22'' [illegible]
patio V. servit nobis ad parallaxin Martis accuratius [illegible]
[illegible] inclinationis et de [illegible]
Terris [illegible]. Verus Solis locus in 23° 59' [illegible]
oppositio vera. Distabant sidera per 2° 26' 49'' [illegible]
summa 1° 23' 35''. Ut haec ad 24 horas, sic 2° 26' 49'' [illegible]
quibus de motu Martis competunt 42' 7'' [illegible]
6. Martii h. 7. 23'. Locus [illegible] 25° 43' 53'' [illegible]
[illegible] 55'' pro reductione ad orbitam [illegible]
Latitudo decrescebat. Erat igitur paulo major [illegible]
per parallaxin [illegible]
[illegible] Anno 1589 [illegible] Aprilis [illegible]

[illegible]

[illegible] h. 6. 23′ p. m. Locus in 4° 24′ 30″ ♏ vel [illegible] refractio contigerit aut parallaxis [illegible] prius nimium [illegible]. Pro reductione ad orbitam insensibile quippiam esset [illegible] 12° absit a nodo, circiter 24″) quae sunt nullius [illegible] in 4° 24′ ♏ cum latitudine 3′ auctiore quam prius. [illegible] ab octavo Martii decrescebat, neque maxima fuit in [illegible]

[illegible] 1591 nocte quae sequitur 6. Junii h. 12. 20′ inventus [illegible] 22′ [illegible] cum latitudine 3° 55½ mer.: ubi de refractione [illegible] magna fuit, cum Mars in meridie non majorem 6° altitudinem [illegible] tabula refractionis fixarum; parallaxeos vero nulla facta [illegible] distet a Terra dimidio distantiae Solaris. Quare paral- [illegible] (posito quod Solis sit 3′), quam tamen omitto, [illegible] tabula Solis (quae ut dixi probabilior est) suppe- [illegible] quam ea, quam ille Braheus usurpavit, quibus [illegible] partibus quia Mars in meridiano et prope punctum [illegible] longitudinis parallaxin. De latitudine tamen videa- [illegible] aliquot scrupulis minor fuerit, parallaxi sci- [illegible] austrum projiciente. [illegible]

[illegible] 24′ 58′ 40″ ♊. Differentia inter sidera 2° 16′ 10″. [illegible] 8″, ♂ (diurnus 4) 1° 12′ 24″, quia 10. Junii h. 11. 50′ [illegible] ♂, cujus ergo diei, 18′ 12″. Summa diurnorum [illegible] dies 1 h. 12 24′, quae ad diem 6 h. 12. 20′ [illegible] (oppositio) monstrant d. 8. h. 7. 49′. Locus ♂ in [illegible] 52″ pro reductione ad orbitam, ut sit [illegible] latitudo 61′ major, quam 6. Junii, quia ex obser- [illegible] latitudo usque ad diem ab oppositione [illegible] 10. Junii 12′ fere. Igitur neglecta parallaxi [illegible]

[illegible] 24. Augusti [illegible] inventus est locus Martis [illegible] latitudine [illegible] Altitudo tanta, [illegible] 29. Augusti [illegible] Decres- [illegible] 14 diebus ante [illegible] Locus [illegible] 35′ 30″. [illegible]

IX. Anno 1597 die 10. Dec. h. 8. 30' situs [illegible]
locus ♂ 2° 45' ♋ locus ☉ in 29° 4' 52" [illegible]
42. 46' 27". Diurnus ☉ 61' 20", ♂ 23' 40" (enim [illegible]
diurnus 23', anno 1582 in 17° ♋ fuit 24'). [illegible]
Quibus elementis ostenditur, sequi tempus verae oppo[illegible]
d. h. 7. 14', d. 14. Dec. mane h. 3. 44'. Locus ♂ 2° [illegible]
ductio ad orbitam (ridicula sane hoc loco, cum observat[illegible]
scrupulorum incertitudinem habeat) requirit 52" [illegible]
correctus locus 2°. 28' ♋. Latitudo ex fide tabulae 3° 33' [illegible]
Ejusdem noctis (quae sequitur diem 10. Dec.) [illegible]
Fabricius in Ostfrisia locum ♂ in 3° 40' ♋ [illegible]
Qua observatione [illegible] quidem [illegible]
rum 3. 40' motus est 3½' [illegible] Brahe [illegible]
h. 12½' ♂ in 3° 42' [illegible] Fabrici[illegible]
X. Anno 1600 d. 13/23. Jan. h. 11. 40' [illegible]
[illegible] est planeta in 10° 38' 46" ♌ [illegible] ☉
Distant sidera 7° 12' 16". Diurnus ☉ [illegible]
1° 1' 3", ♂ 23' 44", summa 1° 24' 47". Sequebatur [illegible]
dies 5 horas 2. 22", nempe 18/28 Jan. mane [illegible]
♂ in 8° 38' [illegible] Reductione non est opus, cum [illegible]
[illegible] ex fide tabulae 4° 30' 50" Bor. [illegible]
XI. Anno 1602 d. 18/28 Febr. vesperi h. [illegible]
Tychonicis adjutante studioso Matthia [illegible]
accepi distantias Martis a mediis [illegible]
distantias inter [illegible] Procyonem [illegible] 37° [illegible]
37° 19' 50" [illegible] intellectum, [illegible]
Martis [illegible] distantias 52° 19' [illegible]
56° 22', [illegible]
cise fuisset in eadem longitudine [illegible]
[illegible]

[illegible] parallaxis 2' 41". [illegible] fuerit latitudo sept. [illegible] ex [illegible] 1° 10½'. Et quia altitudo [illegible] 57½°, [illegible] horizonte parallaxis 4' 13". Sed quia Mars in [illegible] [illegible] loci parallaxis longitudinis 2' 36", qua [illegible] in 13° 18' [illegible] proxime. Locus Solis [illegible] 16' 42" [illegible] Distantia siderum 3° 1' 18" [illegible] 24' 5". Nam in 21° ♌ anno 1585 erat 24' 18" in 26° [illegible] summa diurnorum 1° 24' 9". Sequebatur igitur [illegible] [illegible] horas 3. 43', scilicet d. $\frac{21.\ Febr.}{3.\ Mart.}$ h. 2. 13' [illegible] [illegible] Pro reductione ad orbitam auferenda 40" [illegible] [illegible] latitudine paulo minore quam prius: decrescebat enim [illegible] 4° 16' aut 4° 7½', neglecta parallaxi.

[illegible] a morte Tychonis rariores a nobis sunt habitae, [illegible] consuleret [illegible] David Fabricius in Frisia Orientali, [illegible] [illegible] veteri h. 5. [illegible] distantias [illegible] [illegible] Leonis et vice [illegible] [illegible] argumento ejus longitudinem. [illegible] [illegible] tomi primo Progymnasmatum, [illegible] (ut hic) [illegible] Sed [illegible] [illegible] observationibus. [illegible]

[illegible]

ad 23. Febr. h. 12. per dies 7. h. 19. motus est [illegible]
Una hora propemodum 1'. Si etiam hoc perpendas, [illegible]
laxin (si qua est) ademisse, die 23. Febr. nonnihil [illegible]

Et quia sequitur ultima observatio tempus opp[illegible]
diebus 2 h. 21. 47', adde igitur motum huic tempori [illegible]
prodibit locus 12° 26' ♍. Consensus itaque pulcher[illegible]
esse potest, quod soli simus uterque nec iis instructi co[illegible]
Tycho Brahe. Latitudo etiam die 16. erat 4° 12', die [illegible]
santaneum igitur, ut intermedio die 21. esset 4° 9' et [illegible]
tractionem paulo major. Scilicet et ego ponebam paulo [illegible]
4° 10⅔' hoc est 4° 10'.

XII. Denique anno 1604, cum jam scriptam Ep[illegible]
in qua planeta nocte inter $\frac{\text{29. et 30. Mart.}}{\text{8. et 9. Aprilis}}$ reponeretur in [illegible]
in Spicam, id quidem manifeste apparuit. Nam vesper[illegible]
bat in ortum, 9. Aprilis jam in occasum. Tunc [illegible]
(coadjutore meo Joanne Schulero) inter Arcturum et Sp[illegible]
esse 29° 1½'. Ergo abundabant 2½': statim inter A[illegible]
ergo correcte 29° 44'. Cumque sit Arcturi latitudo [illegible]
linquebatur latitudini ♂ 2° 21½'. Tunc inter cor [illegible]
statim inter cor ♌ et Spicam tantundem: debuit [illegible]
dabant itaque 6½', prius tantum 2½'. Haec [illegible]
discerni non potuit impedimentis objectis, ut pergere [illegible]
erimus. Sit autem (ut prius) excessus 2½', quare [illegible]
♌ 54° 6' et peccatum circa Spicam, forte quod pr[illegible]
erant enim propinqui invicem. Prodit hinc latitudo [illegible]
tulo 18° 25' [illegible] Hoc habetur ex eo, quod [illegible]
cujus ascensio recta 199° 13' tempore observationis [illegible]
locus 28° 56' 24'' ♈, [illegible]

[illegible]

[illegible] omnia in sequenti tabella, additis longitudinibus [illegible] vel ex Prutenicis, vel ex peculiari [illegible], quas [illegible] his demonstrationibus sed nihil opus. Nam [illegible] motus medius, postmodum eam invenit. [illegible] [illegible] ad intervalla temporum [illegible]

	Longitudo	Latitudo	Long. media
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	8. 38. 60 ♊	1. 40. 0.	7. 26. 49. 31
[illegible]	15. 55. 00 ☉	4. 0. [illegible]	8. 34. 55
[illegible]	21. 30. 10 ☿	4. 32. [illegible]	4. 20. 8. 19
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	4. 33. 0 ♏	1. 12. [illegible]	7. 14. 18. 28
[illegible]	[illegible] 30 ♐	1. 0 [illegible]	[illegible] 3. 40. 00
[illegible]	12. 16. 0 ♓	[illegible]	11. 0. 35. 4
[illegible]	17. 31. 40 ♉	0. 8 [illegible]	1. 7. 11. [illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

[illegible] principalis referri [illegible]; quod [illegible] epicycli centrum fert, [illegible] Terrae et centrum [illegible] [illegible] Nec ulla demonstratione [illegible] superioribus.

Copernicus ut saepe alias [illegible] accommodata sua [illegible] ad [illegible]

[illegible]

[illegible] media illius loci (11ˢ 9° 56′) ab hujus longi[illegible] prehenditur interesse 8ˢ 5° 5′, plus nempe dimidi[illegible] igitur a ♍ per ♒ in ♓ tanto brevius commor[illegible] singulatim expendas et arcus interjectos cum tempo[illegible] dine longitudinis compares, deprehendes planetam in [illegible] zodiaco tardissimum, in opposito velocissimum, [illegible] ratione propinquitatis ad alterutrum) paulatim cursum [illegible] mittere.

Haec arguunt primo motum planetae (quamvis [illegible] circulationibus tamen administrari, quarum haec est [illegible] atque in idem reditio. Nam si planeta rectis lineis [illegible] incederet (ut si latera quinquanguli perambularet, [illegible] olim fui), pro ratione linearum aliquando subita fieret [illegible] celerioris in tardiorem evidenti discrimine, idque [illegible] diaci locis contingeret pro laterum multitudine. [illegible] tas, post remotam inaequalitatem quae ex Sole pende[illegible] motu planetae: ergo simplicis circuli positione (cuju[illegible] stituatur) vel administrari vel demonstrari non pot[illegible] compositionem plurium circulorum vel quasi (ut Ptole[illegible] misit), idque duobus modis quam simplicissime: vel [illegible] concentrepicycli usurpatione.

Elegit itaque Ptolemaeus eccentricum pro prima [illegible] nis et captus juvandi causa, eo quod epicyclus [illegible] necessarius. Deinde hoc generale dictum [illegible] cum planetis sufficere. Nam postquam [illegible] sentaneum sit, circumeuntibus uni epicyclo pro [illegible] prima inaequalitate salvanda, collatis observation[illegible] cycli centrum multo propius accedat ad Terram [illegible] in perigaeo, quam simplex eccentricus ille, [illegible] [illegible] hinc [illegible] [illegible] referque, se deprehendisse, [illegible] epicycli centrum fert, sit praecise [illegible] Terrae et centrum aequalitatis [illegible] [illegible] Nec alia [illegible] [illegible]

[illegible]

[illegible] non erat certum, duplam esse) cognoscendam perduceret. Cum [illegible] tribus ἀκρονύχιοις observationibus et hac praeconcepta [illegible] eccentricitatum evinceret et apogaei locum et cor- [illegible] mediae, denique et quantitatem eccentricitatum: vidi [illegible] hoc, eperveretur (surrepto axiomate de proportione eccen- [illegible] futurum et casus non unius, itaque quarta insuper obser- [illegible] vicissim firmandum. Hac igitur arte instructus anno 1600 [illegible] laetusque didici, ab ipso quoque investigatam non [illegible] proportionem, ut numeri ejus indicant. Facit enim eccen- [illegible] cujus definitio est initio cap. V. hujus libri) centrum distare [illegible] particulis, quarum aliis 3780 punctum aequalitatis ab hoc [illegible] quod esset in forma Ptolemaica, ac si distantiam centrorum [illegible] faceret 9900, reliquam inter centrum eccentrici et punctum [illegible]

[illegible] et ipse uti dimidiatione pro certa, idque meliori jure [illegible] quia in Mysterio meo cap. XXII. causam ejus dimidiationis [illegible] verum ob id ipsum ad Tychonem veneram, ut ex ejus [illegible] placita libello dicto promulgata certius inquirere [illegible] feci sine praejudicio et etiamnum facio. Quodsi [illegible] astronomia suam puritatem et perfectionem nanciscetur, [illegible] in illo libello ad ejus tribunal devolvi) pronunciari [illegible] me libellum illum retractaturum et confirmatis quae [illegible] quae secus habent fideliter detecturum. (Comp. [illegible]

[illegible] Centro B (Fig. 69) scribatur eccentricus FG; in eo per B [illegible] per aliquot annos quasi immutabilis. Hoc si periculum [illegible] nobis media hoc quoque cavendi. In hac infra B [illegible] C centrum illud, apud quod anguli spatiis tem- [illegible] circa A (ut paulo supra dictum) non propor- [illegible] F, G, D, E, observationes quatuor per ambitum [illegible] secunda, sic [illegible] Nam apud Ptolemaeum quidem A [illegible] Terra, apud Tychonem vero et Coper- [illegible] FA, GA, DA, EA, et A Sol [illegible] Supra vero [illegible] inaequalitate secunda perinde exui. [illegible]

[illegible]

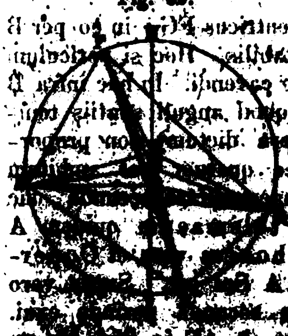
nisi fortasse quis universam doctrinam ... in unum ...
copiosius velit.

At vide quid facere jussi simus. Nam et angulum ...
cum linea AF habeat locum certum sub fixis, ...
assumetur habere locum certum sub fixis. Esto vero ...
Copernicana et Tychonica notione linea aphelii. Ergo ...
exponere, quod erat quaerendum. Nam ut hoc ...
viam coepimus ingredi. Eodem modo cum AH (id est CH) ...
per hanc nostram positionem fuerit adepta ...
aequantis circuli (ideoque etiam per initium ...
numerari, utpote ab apside, quae concipiatur supra H) ...
angulum FCH, ergo et CF linea ...
ferentia. Atqui haec est longitudo media, quae ...
respondet, et hujus longitudinis mediae notitiam quaere...
igitur praeter apogaeum et aliud quoque ex iis quae ...

Verum enimvero non est ingeniens neque geometr...
neque dialecticis, uti argumenti forma ad impossibile ...
ex assumtis sequi aliquid absurdi, ea tanquam ...
per, quoad computatio hoc pacto excessibus et defectibus ...
posse mathematicas disciplinas in medio utrorumque ...
autumetur in praesentia in hunc modum.

Caput ...

Fig. 69.



lineaorum inclinationes ...

CDA, CEA ...

... AG, AE, ...

[illegible] mensuram conciliaturum. Non enim circularium [illegible] est proportio quae rectarum. Expendas tibi labor [illegible] iterato, dum tua summa quaesitorum angulorum sit [illegible]: minima enim tuto negliges. [illegible] ut anguli F, D (ideoque et [illegible] G, E) [illegible] circumferentia; jam porro et alterum [illegible] quod explorandum est, utrum videlicet B centrum [illegible] circuli [illegible] eadem linea. Nam de hoc supra dictum, quod Ptole-[illegible] [illegible], et rationes physicas requirant, [illegible] ubi sidus ab A Sole distat longissime, ut in H: quod [illegible], quam si A, B, C sint in eadem linea. Ut hoc [illegible] (GAD, DAE) noti, ut angulus GAE noscatur; et [illegible] et lateribus (GA, AE) quaeratur latus GE. In [illegible] GFE stat ad circumferentiam, ergo GBE [illegible] est ejus. Prius autem GFE investigatum fuit [illegible] AFE. Rursum igitur in triangulo GBE [illegible] GE latus. Quare [illegible] anguli ad [illegible] circuli in proportione AG eccentricitatis [illegible] habetur BG et BGE, prius vero habebatur AG et [illegible] (AGE a BGE [illegible]) [illegible] AGB dantur AG et BG et interjectus [illegible] angulus BAG. Qui [illegible] discrepat a CAG [illegible] est, [illegible] (B) contra quam [illegible] CA. Rursum igitur falsa pronunciabimus [illegible] FCH, mutato vero FAH, in aliud etiam [illegible] quod D, E, F, G loca non quadrant in [illegible] hoc [illegible], antequam ipsum FAH tantae [illegible]: patet igitur, etiam FCH esse mutandum. [illegible] quantitas ipsius FCH pro lubitu, [illegible] vel [illegible] vices variemus FAH tantisper, [illegible] ad E, D [illegible] faciant duos rectos, et [illegible] GFE, GBE, BGA [illegible] secundum [illegible] BAG, [illegible] CAG [illegible] ad [illegible] BAG [illegible] BAG in illa [illegible]. Ea ubi [illegible] BG [illegible] anguli [illegible]

[illegible]

Copernico et Regiomontano objectum in hoc [illegible]
Eant igitur et schema geometrice ipsi solvant et [illegible]
Mihi sufficit ad quatuor vel quinque conclusiones [illegible]
quo quatuor observationes et duae hypotheses insunt) [illegible]
ad viam e labyrintho remeandam, pro lumine geometrico [illegible]
tamen ad exitum dirigaris) ostendisse. Si difficilis [illegible]
multo difficilior investigatu res est sine methodo.

Sequitur nunc exemplum praeceptionis hujus in [illegible]
vationibus. Reducuntur autem omnes loci causa praecess[illegible]
observationem: ubi longitudo visa in 25° 43′ ♍, longitudo [illegible]
motus annuus fixarum est 51″, ut Braheus demonstravit [illegible]
Ergo ab anno 1587 d. 6. Martii in annum 1591 [illegible]
3 menses, quibus respondet de motu praecessionis 3′ [illegible]
nobis est visus locus anno 1591 in 26° 39′ 28″ [illegible]
9s 5° 40′ 18″. Sic ab anno 1587 d. 6. Martii [illegible]
d. 25. Augusti sunt anni 6, menses 5 1/2, quibus [illegible]
sionis 5′ 30″. Ponendus itaque Mars in 12° 16′ 20″ [illegible]
11s 9° 49′ 34″. Denique ab anno 1587 d. 6. Martii [illegible]
d. 31. Oct. sunt anni 8, menses 8 fere, quibus [illegible]
Itaque reponendus Mars in 17° 24′ 32″ ♉, et longitudo [illegible]

Ponamus statum primae apogaei [illegible]
28° 44′ 0″. *Secundo ponemus longitudines mediae* [illegible]
ut sint longitudines mediae 6s 0° 50′ 56″, 9s 5° 40′ [illegible]
1s 5° 16′ [illegible]



[illegible]

Sin. GCH 79928	AG	Sin. DCH 19240	AD	Sin. ECH 92066	AE
Sin. CGA 15764		Sin. CDA 4004		Sin. CEA 17773	
78820	50	16016	4	88865	5
11080		3224		44010	
11035	70	3203	80	35546	2
45	3	208		5464	
		200	5	5330	30
		8	2	131	7

Pro angulis ad A.

AG 26° 39′ 23″ ♐	AD 12° 10′ 30″ ♓	AE 17° 24′ 22″ ♉
AD 12. 10. 30 ♓	AE 17. 24. 22 ♉	AF 25. 43. 0 ♍
GAD 75. 31. 7	DAE 65. 13. 52	EAF 128. 18. 38
[illegible]		
103. 28. 53	114. 46. 8	51. 41. 22

Pro angulis ad F, D.

[illegible] FG, AFE, ADG, ADE, *sunt propemodum dimidia de com-* [illegible] *A ad semicirculum: minores tamen qui ad F, eo* [illegible] G 50703, AE 52307 *breviores sunt* [illegible] AF [illegible] *ad D, eo quod* [illegible] AG *et* AE *sunt* [illegible] 13052. *At cum illi quatuor circa A* [illegible] *complementa ad semicirculum juncti, aequabunt* [illegible] *quatuor semicirculi sunt octo recti.* [illegible] *ergo* [illegible] *sunt duo recti,* [illegible] GFE, [illegible] *ad F,* [illegible] *dimidiis* [illegible] *eos, qui ad D, excedant sua comple-* [illegible] *differentiae angulorum ad basem, in hoc genere* [illegible] *laterum differentias* [illegible] *laterum* [illegible] *Ergo* [illegible] *ad F* [illegible] *ad D,* [illegible] F [illegible] *duos rectos.*

GAD	DAE	EAF
52. 15. 27	57. 23. [illegible]	25. 50. 41
129098	15527 [illegible]	[illegible]
AG 50703	AD 13052	AE 52307
[illegible]	AE [illegible]	AF 60438
[illegible]	[illegible]	[illegible]

[illegible]

Sed HCF 32° 3′ 36″, GCF 53° 7′ 2″, DCF 11° ...
CFA 1. 7. 56, CGA 9. 4. 14, CBA ...

Ergo AF 59341, AG 50740, AB 47815
AG 50740, AD 47815, AB 52281,
Tg. angul. 44° 31′ 48″ — 52° 14′ 27″ — 37° 23′ ...
98373 129093 156271

Prosth. F = 4° 28′ 41″; B = 2° 11′ 37″; D = 3° 59′ 10″
2. 11. 37

Summa ad D = 6° 10′ 47″

Hic summae differunt non plus 1′ 48″. *Itaque* ... *vimus apogaeum, atque id per* 12″ ... *illa differentia tunc est non necessaria.* ... *tione, ut in methodo nostra uberius progredi* ... *pendiremus defectu per* 28′ 18″, *summa differentiarum* ... 12° 1′ 44″. *Jam ubi excessu* 1′ 48″ *peccavimus,* ... 12° 10′ 46″. *Cum itaque* 31′ *fuerint in summa differentiarum* ... 1⅓′ *faciunt propemodum* 1′, *ut justissima summa* ... *cujus dimidium* 6° 9′ 22″ ...

Pro triangulis GFE, GBE ...

... FAE dimidium ... 44° 31′ 48″ ... 20° 23′ ... 23° 13′ ...

GAD = 75° ...
DAE = 68. 17. 32

Ergo ...
... GA ... 50740 ...

Ut sinus ... *ad* AE, *sic sinus* GAE ...
GE = 97...

CDA 2° 17′ 10″ ... hinc

AD 47887,

D 3° 57′ 24″ F

4. 37. 24 4. 48.

Summa altera 5° ... 17″

... quae tolluntur retractiones aphelii per 38″; ut, quia ... jam erit in 28° 48′ 30″ ♌.

P r o b a.

... ECI 52° 7′ 54″, DCI 11° 1′ 22″, ECI 68° 17′ 23″; hinc

AC 52769, AD 47931, AE 52317

AD 47931 AE 52317 AF 59219

AC + AD = 98700; AE + AD = 100248; AF + AE = 111536

AC − AD = 2838 AE − AD = 4386 AF − AE = 6902

... Triangulo in circulum inclusa ... B sit ...

... GPE ... GE = 25° ...

... loco physicam retardationis ...

... 7′ 20″ ...

BG 53860, AG 50739, BGA 5° 51′ (2″), BAG 62° [illegible]

	BG	AG	BGA	BAG
Jam	53866	50769	5. 48. 57	62. 16. [illegible]
Differentia	6	30	7. 5	[illegible]
pergendum	2	11	2. 25	[illegible]

BG *corr.* 53868; AG 50780; BGA 5° 41′ 32″; BAG 62° [illegible]

$$\frac{100000}{53868} = 18564; \quad \frac{\sin. 5° 41′ 32″}{\sin. 62° 8′ 37″} = 11[illegible]$$

Manet igitur eccentricitas tota 18564
eccentrici vero 11332 [illegible]
et aequantis 7232 [illegible]

In forma Copernicana et Tychonica esset diameter [illegible] majoris 14948. Vel secundum ea, quae in fine capitis [illegible] pro sinu tangens sumatur in hunc modum:

Investigetur aequatio maxima ad gradum nonag[illegible] 90°; *erit* BC *sinus anguli* BGC 4° 8′ 51″, *et* GBC [illegible] 99738. *At in forma Copernicana* C [illegible] GC 100000. *Ut igitur* CGA *angulus aequationis* [illegible] *et Copernico in eadem proportione augendus est:* [illegible] / 99738 [illegible] *pernico-Tychonica eccentricitas composita. Et* [illegible] *exhibet* 10° 31′ 38″ *commune, aequationis* [illegible] *malias* 90. *Ergo minoris epicycli diameter correcta* [illegible]

Confer ista omnia cum cap. V. ubi restitutionem [illegible] ad apparentem Solis motum transposui: et vide, quam [illegible]

Atque hac methodo ex quatuor [illegible] inaequalitatis est investigata: In qua [illegible] planetae per coelum disposita [illegible] item iis locis physicam retardationem [illegible] a centro Terrae (secundum Ptolemaeum) vel Solis ([illegible] Copernicum) [illegible] retardationis [illegible] strandi est, ad impossibile ducere. Utrum [illegible] strandum assumta vere ita habeant [illegible]

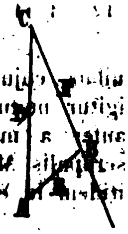
Jam etiam reliqua loca octo ad hanc [illegible] [illegible] Sed ut [illegible] universale [illegible] [illegible] Hunc [illegible] prius investig[illegible]

[illegible]

[illegible] prodidit 4153, qualium semidiameter orbis est [illegible]. 4.) Tertio, apogaeum Solis haesisse in $5^1/_2$° ♊ (ibidem) [illegible] (motu ejus ad medium Solis motum accommodato) [illegible] (Ptol. X, 7.). Quinto, eccentricitatem ♂ fuisse [illegible] semidiameter 100000 (ibidem). Sexto, proportionem epi[illegible] vel orbis anni (Tychoni et Copernico) ad orbem [illegible] 100000 ad 151900. Quare qualium semidiameter orbis [illegible] est 100000, talium erit eccentricitas Martis 30350.

[illegible] *Sit A punctum, ex quo describptus est orbis* [illegible] *aequatorium Martis, B centrum orbis* [illegible] $5^1/_2$° ♊, *AC vero in* $23^1/_2$° ♋, [illegible] *AB ponitur 4153, AC vero earundem* [illegible] *Datis igitur duobus lateribus et angulo* [illegible] *angulo CBA 123° 27′. Et quia BA* [illegible] *igitur BC subtendit angulo 123° 27′* [illegible] *idque tempore Ptolemaei. Simul CB* [illegible] *transpositionem ad verum motum* [illegible] *Supra hanc inveni ex transpositione Tycho*[illegible] 18342: *uno mutato, quod pro quantitate* [illegible] *veriorem usurpavi* 152500. *Sed haec* [illegible]

Fig. 70.



[illegible] motu apheliorum.

[illegible] tempora Ptolemaei praecessio [illegible] abat, ante et post nulla [illegible] residua. Separabo hanc [illegible] ad fixa sidera. Fuit [illegible] aetate in 2° 30′ ♌. Ergo [illegible] seu aphelium hanc stellam [illegible]. Nostra aetate [illegible] hoc anno Christi [illegible] procedit in [illegible] Leonis per 4° [illegible] [illegible]

Tabella motus apheliorum et nodorum.

Anni	Aphelium ′ ″	Limes & Nodi ′ ″
1	1. 4	0. 40
2	2. 8	1. 21
3	3. 12	2. 1
4	4. 16	2. 42
5	5. 20	3. 22
6	6. 24	4. 3
7	7. 28	4. 43
8	8. 32	5. 24
9	9. 36	6. 4
10	10. 40	6. 45
11	11. 44	7. 25
12	12. 47	8. 6
13	[illegible]. 51	[illegible]
14	[illegible]. 55	[illegible]. 47
15	[illegible]. 59	[illegible]. 7
16	[illegible]. 3	[illegible]
17	[illegible]. 7	[illegible]
18	[illegible]. 11	[illegible]
[illegible]	[illegible]	[illegible]

Ann.	Aphelium Secund.	Lineae & Nodi Secund.
1	5	3
2	11	7
3	16	10
4	21	13
5	27	17
6	32	20
7	37	23
8	43	27
9	48	30
10	54	33
11	59	37
12	1′ 4	40

De motu [illegible]
Cognationis [illegible] dinein, quamvis non [illegible] Ptolemaeus (XIII, 5) [illegible] ait esse [illegible] scilicet 3 ½ [illegible] (III, 6) ob [illegible] boreum in ipsissimum apog[illegible] in 25 ½ [illegible]. At hodie [illegible] 9° 30′, deprehenditur [illegible] quenter nodi per 4° 15′ [illegible] quod quidem [illegible] nibus, cujus fidem apogaeum sub [illegible] igitur motus in antecedentia est [illegible] aufer a motu praecessionis 25′ 59″, [illegible] scrupulis Martis nodi hodiernis 30 [illegible] itidem in consequentia.

Caput XVIII.

[illegible] incertae acronychiorum per inventam hypothesin.

[illegible] calculi forma, quam supra cap. IV. explicavi, quod [illegible]. Certum autem est, in Copernicana seu Tychonica forma [illegible] (quo minus aliquid) vel lucratum vel perditum iri, ut

Anno [illegible]	Anno [illegible]	Anno. 1585	Anno [illegible]
[illegible]	s ° ′ ″	s ° ′ ″	s ° ′ ″
[illegible]	4. 28. [illegible]	4. 28. 48. 55	4. 28. 48. 55
[illegible]	[illegible]	2. 14	0
4. 28. [illegible]. 18	4. 28. 44. 27	4. 28. 46. 41	4. 28. 48. 55
1. 28. [illegible]. 31	3. 9. 24. 55	4. 20. 8. 49	6. 0. 47. 49
3. 55	3. 55	3. 55	3. 55
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	8. 34. 27	32. [illegible]
[illegible]	[illegible]	14000	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	651	[illegible]
[illegible]	[illegible]	6	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	2. 11. 57

[illegible]

	Anno 1589	Anno 1591	Anno [illegible]
	s ° ′ ″	s ° ′ ″	s ° [illegible]
Aphelium anno 1587 . .	4. 28. 48. 55	4. 28. 48. 55	4. [illegible]
Movetur annis intermediis	2. 15	4. 32	[illegible]
Aphel. anno supra scripto	4. 28. 51. 10	4. 28. 53. 27	4. [illegible]
Longitudo media . . .	7. 14. 18. 26	9. 5. 43. 55	11. [illegible]
Adde	3. 55	3. 55	[illegible]
Correcta long. media . .	7. 14. 22. 21	9. 5. 47. 50	11. [illegible]
Ergo angulus C (Fig. 60) .	75. 31. 11	126. 54. 23	11. [illegible]
Sinus	96822	79951	[illegible]
Eccentricitas aequantis .	7232	7232	[illegible]
	65028	50674	[illegible]
	4539	6500	[illegible]
	578	651	[illegible]
	14	48	[illegible]
	2		
	7002	5783	[illegible]
Pars aequationis . . .	4. 0. 55	3. 18. 56	[illegible]
Angulus B	71. 30. 16	123. 35. 27	[illegible]
Dimidium	35. 45. 8	61. 47. 44	[illegible]
Tangens	72002	186484	[illegible]
Quotiens	79843	79843	[illegible]
	35780182	[illegible]	[illegible]
	825929	3882144	[illegible]
	48	47726	[illegible]
	[illegible]	[illegible]	[illegible]
Tangens	57844	148908	[illegible]
	28. [illegible]	[illegible]	[illegible]
	35. [illegible] 8	41. [illegible]	[illegible]
Angulus ad A	[illegible]	[illegible]	[illegible]
Aphelio [illegible] . . .	14[illegible] 16	149. [illegible]	[illegible]
Long. Martis in [illegible]	[illegible] 12	[illegible]	[illegible]
Polus [illegible]	4[illegible] 0	[illegible]	[illegible]
Differentia	3. 2. 12	[illegible]	[illegible]

Vides igitur [illegible] vestigatam [illegible] fundamenta [illegible]

Anno 1597	Anno 1600	Anno 1602	Anno 1604.
4. [illegible]. 55	4. 28. 48. 55	4. 28. 48. [illegible]	4. 28. 48. [illegible]
11. 30	13. 43	15. 56	18. 11
4. 29. 0. 25	4. 29. 2. 38	4. 29. 4. 51	4. 29. 7. 6
2. 25. 11. 56	4. 4. 35. 50	5. 14. 59. 37	6. 27. [illegible]. 12
3. 55	3. 55	3. 55	[illegible]
2. 25. 10. 51	4. 4. 39. 45	5. 15. 6. 32	6. 27. 4. 7
[illegible]. 44. 54	24. 22. 53	15. 55. 41	[illegible]. 57. 1
[illegible]171	41260	27528	[illegible]659
7232	7232	7232	7232
65088	28928	14464	57856
0723	0723	5062	2893
072	145	362	506
51	58	14	36
1		6	6 [illegible]
6598	[illegible]	4961	6130
2. 46. 59	1. 42. 40	1. 8. 26	3. 50. 52
41. 57. 14	22. 40. 13	14. 50. 15	54. 26. 9
30. 58. 52	11. 20. 4	7. 25. 8	27. 13. 5
[illegible]045	20046	13021	51403
79643	79643	79643	79643
677[illegible]	[illegible]256	79643	806215
[illegible]316	319	23893	7964
40	48	159	3186
		8	289
			24
47832	15965	10570	40[illegible]628
[illegible]	[illegible]. 14	5. 58. 14	22. [illegible]. 32
[illegible]	[illegible]	7. 25. 0	27. 13. 5
[illegible]. 22. [illegible]	26. [illegible]	18. 20. [illegible]	49. 29. 37
[illegible]. 25	[illegible]	149. [illegible]	149. 7. 6
[illegible]	[illegible]	[illegible]	[illegible] ♎
[illegible]	[illegible]	[illegible]	[illegible]. 37. 10
[illegible]	[illegible]	[illegible]	[illegible]. 27 [illegible])

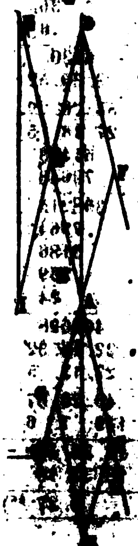
Caput XIX.

[illegible]

religio non fuit, id alicubi negligere, nam observationibus [illegible] paucissimis, ratus fortasse, neque Ptolemaeum usum [illegible] in Magno Operé referuntur. Tycho Brahe hic haesit. [illegible] imitatus proportionem eccentricitatum constituit hanc, [illegible] observationes acronychiae; quam cum redarguerent [illegible] ἀκρονύχιοι (nam his accidit etiamnum [illegible] secunda orta), sed etiam et multo quidem maxime [illegible] cum Sole configurationum inaequalitate secunda affectae, [illegible] et ad Luminaria conversus est, cum ego superveni.

Methodus autem, qua et absolveretur universa theoria, si quae praemissa sunt rite haberent, et quae non rite [illegible] haec est.

Fig. 71.



Primum per latitudines in situ [illegible] *in forma Copernicana linea* DE *in plano* [illegible] *in qua sit* A *Sol*, D *limes boreus*, E [illegible] *proximus illi punctus: et per* [illegible] *plano in planum eccentrici orbis Terrae* [illegible] *autem* AH *et* AD *in uno plano* [illegible] AE; *et sit Terra anno 1585 in linea* [illegible] *anno vero 1593 sit in lineae* AL *puncto* C [illegible] *et* AD *vergunt in* 21° ♌, *ubi* A [illegible] *visa versa vero* E *et* C *in* [illegible], *ubi* [illegible] *in* 12° ♍ *appareat, est vero apogaeo* [illegible] *quam* 21° ♒: *brevior igitur est* BA [illegible] autem has lineas ex folio 98 [illegible] Brahe, et ponam illas bene habere [illegible] nos eo deducentes paulo aliter [illegible] igitur exhibetur HA 97500, [illegible] [illegible] correctione BA paulo [illegible] [illegible] *a limite* 1° 49' [illegible] *Sed* HBD [illegible] 4° 32' [illegible]

[illegible]

[illegible] DE. *Jungantur igitur* DA 163150 *vel* 167350
et AE 139000 *vel* 137080
Tota igitur DE 302150 *vel* 304430
Dimidia DK 151075 *vel* 152215
[illegible] *Ergo* AK eccentricitas 12675 *vel* 15135.
[illegible] *numeri in pristinos, ubi radius eccentrici fuit* 100000.
[illegible] 100000 *sic* 12075 *ad* 8000,
[illegible] 100000 *sic* 15135 *ad* 9943. [**])

[illegible] igitur eccentrici verissime (indicibus latitudinibus acro- [illegible] 8000 et 9943, qualium radius orbis eccentrici est [illegible] nostra ex observationibus acronychiis longitudinum [illegible] eccentricitatem eccentrici 11332, diversam longe ab eo, [illegible] et 9943 loco fere medio. Ergo falsum oportet esse [illegible] Assumtum autem erat, orbitam, qua pla- [illegible] perfectum circulum: esse in linea apsidum punctum ali- [illegible] et constante intervallo a centro eccentrici, circa quod [illegible] temporibus Mars aequales angulos conficiat. Horum [illegible] utrumque falsum est. Nam observationes usur- [illegible]

[illegible] demonstratio etiam contra hypothesin illam, quam [illegible] ad oppositum medii motus Solis reducitur: quia [illegible] utrumque articulum intermedio maneant proxime. [illegible] eccentricitas eccentrici ostenditur 9943, quae tamen [illegible] Braheana assumta fuit 12600, vel in [illegible] 12352, qualium tota aequatorii puncti eccentricitas [illegible]

[illegible] transformatione ad formam Ptolemaicam sit [illegible] A Terra, D, E centrum epicycli in summa et ima [illegible] punctis educantur versus A Tellurem rectae [illegible] in quibus sumantur DF, EG radii [illegible] AG et planeta in F et G. Erit igitur FDA [illegible] GAE, et haec visa AF cum pristina BD [illegible] visa latitudo eadem. Idem de tri- [illegible] itaque demonstratio et quanti- [illegible] eadem. [illegible]

[illegible] epicycli Martis semidiametrum factam [illegible] DF [illegible] EG [illegible] EA [illegible] propter transpositionem [illegible] apparentis Solis. [illegible]

planum epicycli, Tychoni planum eccentrici [illegible]
in austrum et contra, manens sibi ipsi parallelon: [illegible]
utrumque eodem situ.

Interim et hoc nota. Compositam eccentricitatem inv[illegible]
18564, cujus dimidium 9282 est inter 8000 et [illegible]
At docuerat nos et Ptolemaeus (ut supra dictum), [illegible]
acronychiis sitibus inveniretur, dandum esse eccentri[illegible]
igitur nihil fuit quod ipsum permoverat: nec [illegible]
haec bisectio, cum de ea testentur latitudines observ[illegible]

At contra si bisecemus inventam 18564, loca qui[illegible]
medias eccentri acronychia sat praecise repraesenta[illegible]
circa octantes et versus apsidas.

Exempli causa sit anni 1593 *oppositio.* [illegible]
praecedente fuit 6s 11° 3′ 16″. *Multiplico* [illegible]
19174 *in* 9282: *prius erat in* 7232 *multiplicand*[illegible]
arcus 1° 1′ 12″, *seu partis aequationis, qui* [illegible]
efficit semiaequatam anomaliam 6s 12° 4′ 28″ [illegible]
167° 55′ 32″: *dimidium* 83° 57′ 46″. [illegible]
in 90718 *distantiam periheliam multiplicatus et* [illegible]
vicissim divisus producit tangentem 784280. [illegible]
ablatus a priori 83° 57′ 46″, *relinquit* 1° 18′ [illegible]
alteram. Quae addita ad anomaliam [illegible]
refert planetam in 12° 13′ 37″ ♓: *ubi* [illegible]
scrupulis et fit ab observatione habita [illegible]
12° 16′ ♓.

Id luculentius apparet in 17° ♋ *anno* 158[illegible]
tionis cadit Martis in 17° 4½′ ♋, *differentia* [illegible]
circa 45° *ab aphelio, ab observatione* [illegible]

Atque [illegible] hac [illegible] parum differentia [illegible]
[illegible] Ptolemaeus, cum bisectionem [illegible]
[illegible]

Caput XX.

[illegible] hypotheseos redargutio per observationes extra situm acronychium.

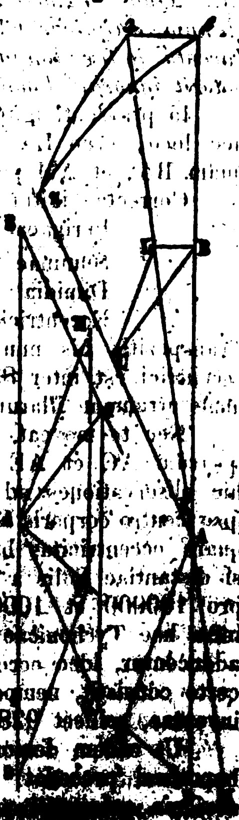
[illegible] alterum argumentum accedam, quo falsa demonstratur [illegible] eccentrici eccentricitas (non obstante, quod veros [illegible] motus): nempe ex observationibus aliarum cum Sole con[illegible] oppositiones, quoties planeta in apsidibus eccentrici ver[illegible].

[illegible] 5/15. Martii circa mediam noctem visus est Mars in [illegible] cum latitudine 3° 23′ bor. Fuit ejus longitudo media per [illegible] correcta 4s 29° 14′ 58″, aphelium vero in 4s 29° 2′ 45″ [illegible] 12″), quae requirit aequationem 2′ subtrahendam per [illegible] eccentricorum supra constitutam. Igitur locus Martis [illegible] 12′ ♌; Solis locus in 25° 45′ 51″ ♓.

[illegible] sit A Sol, B Mars, C Terra. Erit [illegible] CB (29° 12½′ ♌) ab AB [illegible] CBA 30° 9′ 30″, ex subtrac- [illegible] 45′ 51″ ♓) a CB (29° 12′ 30″ ♌) [illegible]. Ut autem sin. CBA ad [illegible] BA. Est autem CA distantia [illegible] Tychonis tabula 99302 (quae etsi [illegible] hanc inter et 100000 consti- [illegible] audiemus). Ergo AB inter [illegible]

[illegible] observatio, quae est habita [illegible] sequentis noctis hora 1. 45′. [illegible] 27° 30′ 30″ ♓ cum latitudine [illegible] media Martis 10s 26° 16′ 38″. [illegible] Abest igitur Mars a [illegible] per hypothesin, supra [illegible] aequationem subtrahendam, ut [illegible] 10s 25° 44′ 30″ locus [illegible] ♌ [illegible] BA [illegible] AD [illegible] ♓ [illegible]

Fig. 72.



Protheorema, quo infra usurpandum [illegible]

Observationibus stellae Martis ad eclipticam [illegible] lineis in plano eclipticae investigatis, [illegible] linearum, quae iis e regione in plano orbitae prop[illegible]

Exponatur BAD (Fig. 72) *linea in plano eclipt*[illegible] *Solem seu centrum mundi denotat, ducatur recta* [illegible] *ut stella sit in* L *et* M. *Sit autem Terra in* C, [illegible] *plano eclipticae, ad quod planum trianguli* LBA [illegible] *connectantur puncta* C, L, B: *continuenturque* [illegible] *sphaerae fixarum,* AB *in* β, AL *in* λ, AC [illegible] *ticae;* βλ *arcus circuli latitudinis,* κλ *arcus* [illegible] *vatio loci stellae sub fixis refertur ad eclipticam* [illegible] *latitudinis ad eclipticam* κβ *recto per locum stellae* [illegible] CLB *est pars de plano illius circuli. Sed et* [illegible] *dinis ad eclipticam* κβ *rectus. Duorum igitur* [illegible] *eclipticam rectorum plana* (CLB *et* LBA) [illegible] LB. *Quare* (*Eucl.* XI, 19) *sectionis linea* LB [illegible] *planum eclipticae* CBA *ejusque lineam* BA [illegible] *Inventa igitur longitudine* BA *in ecliptica* [illegible] *poterit ignorari longitudo* EA *quaesita* [illegible]

In praesenti igitur negotio, cum inclinatio [illegible] hoc loco, ergo LA est in praesenti [illegible] quam BA, et AM per 72 longior quam AD [illegible]

Correctae igitur apogaeae [illegible] 165763 vel [illegible]

Perigaeae	140137 vel [illegible]	
Summae	[illegible]	
Dimidia	[illegible]	
Eccentricitas	[illegible]	

Transpositis his numeris [illegible] eccentrici [illegible] inter 9977 et 10100 [illegible] quae [illegible]

[illegible]

[illegible] F: *utrinque ipsis* BI *et* DF (*lineis motus pla-* [illegible] *paralleli lineae* AG, AH (*motus Solis*). Cetera per

[illegible] hypothesi Tychonica secundae inaequalitatis, *maneat* [illegible] *Sole, et ipsis* AD, AB *paralleli et aequales agantur* [illegible] *in* F *et* I. *Erunt igitur et lineae visionis* [illegible] *Ptolemaeo, et paralleli lineis visionis* ED, OB [illegible] *Quare in eandem a Sole partes vergent, et summa* [illegible] *aequabit priorem* BD; *eritque propter parallelas lineas* [illegible] *eadem quae ab initio capitis.*

[illegible] demonstrationem vitiose constitutae eccentricitatis [illegible] etiam restitutioni Braheanae, quae nititur medio [illegible] dabo, ne quis existimet, hanc dissonantiam ideo evenire, [illegible] a medio ad apparentem Solis motum perperam trans- [illegible]

[illegible] 5. Martii fuit ex sententia Tychonis longitudo media [illegible] apogaeum in 23° 41′ ♌. Ergo anomalia simplex 5° 30′; [illegible] sententia aequationem subtrahendam 1° 7′ 11″, ut sit [illegible] 28° 3′ 52″. Solis vero motus medius 23° 44′ 31″ ♓. [illegible] punctum medii motus Solis, distans a centro [illegible] Solis. Angulus igitur CBA 28° 51′ 22″ et [illegible] Atque hic demonstratio cogit, tam AE quam AC [illegible] 100000, manentibus quae a veteribus et Tychone [illegible] parte tertia ventilabuntur; ubi ostendetur, paulo [illegible] Terrae a puncto medii loci Solis, hoc est epicyclum [illegible] orbem Copernico-Tychonicum non ordinari aequa- [illegible] quod aequales anguli conficiantur temporibus [illegible] fundamentis positis: et sit CA 100000, [illegible]

[illegible] 1593. d. 30. *Julii, cum fuerit longitudo Martis* [illegible] 26° 12′ 43″, *apogaeum* 23° 34′ ♌, *ergo ano-* [illegible] 48″, *quae requirit aequationem* 35′ 52″ *adden-* [illegible] 29° 48′ 35″: *locus Solis* [illegible] *in schemate erit* EDA 20° 50′ 55″ *et* AED [illegible]

[illegible] AD 107800 [illegible] 45, *ut* [illegible]

Ostensum itaque est, etiam Tychonicae [illegible] commodi, ut alia eccentricitas eccentrici prodeat [illegible] reliquis observationibus.

Interim etiam in hac restitutione Tychonica [illegible] bisectionem viam praeeunt. Tychonis enim eccentricitas [illegible] torii est 20160, dimidium 10080, vel in aequantis P[illegible] Et hic invenimus 10312, quod propius ad hanc dimidi[illegible] cedet autem multo propius et infra hanc descendet [illegible] mam 9282): ubi AC majoris schematis, hoc est [illegible] et cum ea AB vel GI (distantia apogaea) fuerit minu[illegible] schematis ejusque aequalis et vicaria DF sinistri [illegible] (distantia perigaea) fuerit aucta. Minori enim parte [illegible] differentia minuitur inter utramque.

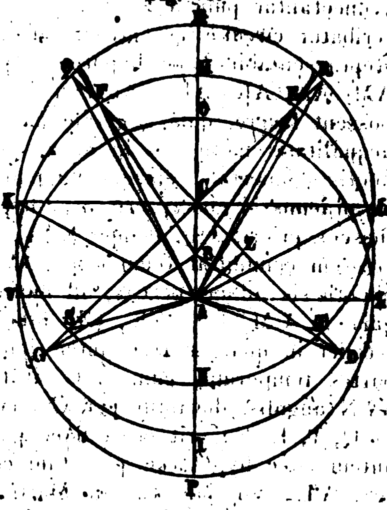
Culpam autem hujus discrepantiae inter diversas [illegible] quaerendae (ut idem memoriae causa saepius repetam) [illegible] assumtionum, quae mihi fuere consulto cum Tychone [illegible] communes. Nam hinc certo concluditur, non esse [illegible] in eccentrico planetae, circa quod planeta perpetuo [illegible] aequales angulos conficiat. Nam illud omnino (siquidem [illegible] de circulari orbita sideris retineremus) librandum [illegible] tum sursum deorsum, quod quomodo cum ratione [illegible] possit, non video.

[illegible] vero et alterum assumtorum infra cap. [illegible] orbitam sideris non esse perfectum circulum, [illegible] omnium esse diametrum apsidum, brevissimam [illegible] figurae transit in longitudinibus mediis. [illegible] reliquas circa oppositionem cum Sole [illegible] constitutae, cum hae falsa in cap. [illegible]

[illegible] quibus fieri potest, ut falsa hypothesis veram aemu-[illegible] subtilitatem circa longitudinem, jam demonstrabo.

[illegible] mundi recta MP [illegible] zodiaci partes, [illegible] Et esto ut per [illegible] hypothesin planeta dimi-[illegible] inter lineas AM et [illegible] sinistram, dimidio [illegible] ut semper post [illegible] restitutorii sit in [illegible]: et hic parti-[illegible] hypotheses suma-[illegible] per aliam aliquam [illegible] Itaque, qualis-[illegible] via alia tortuosa [illegible] linea MP suscepto, [illegible] mundi com-[illegible] MP in duo aequalia [illegible] propositum, pla-[illegible] (qui circa [illegible] in linea MP [illegible] regularis sit)

Fig. 73.



[illegible] A scribatur et aequaliter moveatur OP circulus. [illegible] his circulis aliisque figuris commune, per quod [illegible] propositum, nempe hoc: ut centrum mundi ambiant [illegible] in linea MP regulariter eant. Jam figura vel [illegible] aequalitatis hoc vel illud, ex iis quae sub [illegible] falsum esse potest. At efficiebamus, quod [illegible] per hanc falsam speciem, sed per id, quod in hac [illegible] verum inerat.

[illegible] sit planeta post quartas temporis in lineis [illegible] existentibus MAK, MAL minoribus [illegible] igitur prior circulus OP aberrabit apud latera [illegible] A regularis, recta igitur recta per A, [illegible] MP, [illegible] VX, [illegible] MAV, MAX mensurae [illegible] hypothesis reponeret planetam in li-[illegible] AK, AL [illegible]

[illegible] circulos [illegible]

[illegible]

plicissima et aequabilissima eligere, ideo quaerenda ... centrum moveatur aequaliter, qui nobis efficiat ... stitutis igitur partibus in AK, AL aequalibus ab A ... connectantur puncta K, L recta secante MP in C ... scribatur circulus eccentricus MN, cujus motus sit circa ... Repraesentabit haec hypothesis planetam debitis locis ... AM, AN, AK, AL. At non haec hypothesis sola ... possent facere, quia generale hoc habent et ... aequalitatis motus sit in linea, quae loca planetae ... dentis connectat, ejusque eo puncto, quo secat haec ... ex praemissis absorpserit haec hypothesis errorem ... theseos prioris OP, nempe KAV, LAX circa ... errorem committat (cum circa AM, AP priori ... hypothesis adhuc peccat, id multo minus erit ... quia in CM, CN, CK, CL officium fecit, peccatum ... recedet in quatuor loca inter jam dicta intermedia ... partes temporum, cum in C sit temporis mensura ... KCN angulis, ducantur per C duae novae lineae ... in Q, T, R, S: erit circa haec puncta error ... autem haec hypothesis planetam circa octavas ... AS, AT. Sit jam (ut in Marte), ut non ... temporis restitutorii apparere in lineis AQ, AR ... lineis AF, AE superioribus, sic in AG, AD ... error KAV fuit 10 1/2°, jam error QAF ... Deprehenditur autem in Marte QAF vel ... TAD circiter 28 ...

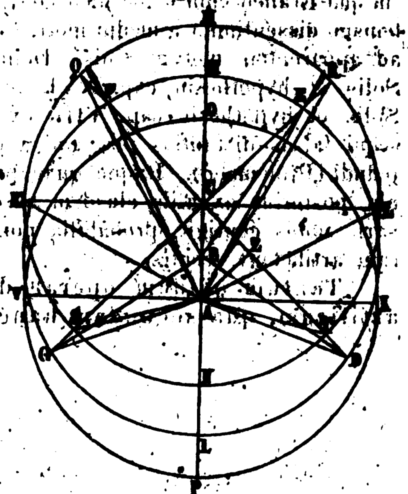
Tertio igitur et haec hypothesis ... ...

[illegible] circulum: ita neque verum citra illos ipsos locos omnitteda [illegible] quatenus accidit huic negotio, ut a sensuum subtilitate differentia [illegible] non possit.

[illegible] eadem hebetudo sensuum tegit etiam hunc errorculum, qui [illegible] superest. Superesse autem sic demonstro.

[illegible] *aequales* [illegible] BC [illegible] *arbitrio* [illegible] *exhibere* [illegible] SAG. *Fiet enim* [illegible] *Veniat* [illegible] A [illegible] QT, *quae sit* AZ. [illegible] 18564 [illegible] *Et quia* ACZ 45°, [illegible] ZQ 143127 [illegible] QAZ 83° 22′ 55″, [illegible] *Sumatur autem* [illegible] *erit ejus tangens* FZ [illegible] AZ *est* 13127, [illegible] *Quare* QF 2217. [illegible] QF *quam* TD, *quod* [illegible] QT *est diameter cir-*

Fig. 73.



[illegible] *est ipsis* FB, BD *semidiametris junctis. Sed* BF, BD [illegible] *majores quam* FD, *ergo et* QT *major quam* FD; [illegible] *major igitur residua* QF *quam* TD. *Et tamen nos* [illegible] *aequalem esse. Subtrahatur* CZ 13127 *a* CT, [illegible] *Igitur ex* AZ, ZT *noscitur* ATZ *atque* 8° 35′ 33″. [illegible] 27″. *Et quia* ZT 86873, *addam ei aequalem ipsi* [illegible] *scilicet* 2217. *Fiet* ZD 89090. *Sed qualium* AZ [illegible] *tangens anguli* ZAD 686291. *Itaque hic angulus* [illegible] *fiet* 81° 24′ 27″. *Ergo* TAD *vel* SAG *minor* [illegible] *eo quod* TD *sit minor quam* 2217.

[illegible] angulum TAD, qui debuit esse 27½′. Itaque [illegible] 12′ fiet TAD 24′. Atque utrinque planeta 3′ fiet [illegible] nimis videbitur magna: quare eccentricitas nimia [illegible] paruumper, ut in lineis AK, AL planeta circiter 1½′ [illegible] D, E, F, G, totidem (scilicet 1½′) altior.

[illegible]

facile possit, cum observationes usurpatae non [illegible] octavasque temporum.

Conclusio secundae partis.

Hactenus itaque traducta fuit hypothesis primae [illegible] (in qua Braheo cum Copernico convenit; utrique vero [illegible] lemaeo dissentiunt) a medio motu Solis, quem omnes tres [illegible] ad apparentem motum Solis. Deinde ostensum est, sive [illegible] Solis et hypothesin cap. XVI. inventam sequamur, [illegible] Solis et hypothesin cap. VIII. ex restitutione Brahei [illegible] sequi falsas distantias planetae a centro seu Solis (Copern[illegible] mundi (Ptolemaeo). Itaque quae prius aedificaveramus [illegible] nis, posterius ex aliis ejusdem observatis rursum [illegible] sario nobis contigit, probabilia nonnulla sed re vera [illegible] rum artificum) secutis.

Tantum quidem operae datum est [illegible] artificum, qua secundam hanc Commentariorum [illegible]

COMMENTARIORUM
DE MOTIBUS STELLAE MARTIS
PARS TERTIA.

INVESTIGATIO SECUNDAE INAEQUALITATIS, ID EST MOTUUM SOLIS VEL TELLURIS.

SEU CLAVIS ASTRONOMIAE PENITIORIS.

UBI MULTA DE CAUSIS MOTUUM PHYSICIS.

Caput XXII.

Epicyclum seu orbem annuum non aequaliter circa punctum aequalitatis motus situm.

In hunc igitur modum antecessores nostri primum inaequalitatem primam mensi sunt. Postea calculo constituto, qui locum planetae eccentricum repraesentaret ad quodvis momentum, conversi sunt ad inaequalitatem secundam (quae a Sole pendet) explorandam, comparantes locum visum seu apparentem cum loco eo, quem eccentricus et sola prima inaequalitas planetae assignarent. Cum autem mihi hanc eandem semitam eunti anceps bivium apparuerit superiori capite XIX. et XX; et observationes (fidissimi duces) cum observationibus pugnare sint deprehensae: cogitandum fuit de tota ratione itineris aliter instituenda, methodo quae sequitur.

Primum hac parte tertia aggrediar secundam inaequalitatem et in illa per observationes indubias demonstrabo vel confirmabo vel refutabo, quae hucusque in principiis posui, dubio tamen assensu: nam hac veluti clave inventa reliqua patebunt. Postea parte quarta ad inaequalitatem primam accedam.

In Mysterio Cosmographico cap. XXII. cum physicam causam aequantis Ptolemaici vel secundi epicycli Copernico-Tychonici redderem, mihi ipsi objeci in fine capitis: quod, si causa a me allata genuina esset, omnino per omnes planetas valere debuerit. Cum autem Tellus, una ex sideribus (Copernico), vel Sol (reliquis), aequánte hoc hactenus non indiguerit, speculationem illam incertam esse volui, quoad astronomis amplius liqueret. Suspicionem tamen concepi, fore et huic theoriae suum aequantem. Postquam in Tychonis notitiam veni, suspicio haec in me confirmata fuit. Nam Braheus in literis anno 1598 ad me in Styriam missis haec verba ponit: „Orbis annuus juxta Copernicum, vel epicyclus secundum Ptolemaeum non videtur ejusdem semper magnitudinis, quoad ipsum eccentricum colla-

tione facta; sed alterationem adducit in omnibus [illegible] bilem, adeo ut angulus differentiae in Marte ad [illegible] (Comp. Vol. I, p. 44.)

Idem eodem tempore in appendice ad Mech[illegible] suis studiis perstrinxit. Nec multo alia verba [illegible] fol. 209. [*]) ubi existimat, causa eccentricitatis Solaris [illegible] inaequalitatem etiam eccentrici aequationibus et [illegible] [illegible] refutatum quidem est, non redundare in [illegible] [illegible] aliquid, ut videtur per correctionem [illegible] lationibus Martis cum Sole intelligi debere.

Jam tum, cum orbem annuum audirem augeri [illegible] genius, id phantasma oriri ex eo, quod orbis annuus Co[illegible] cyclus Ptolemaei non aequaliter a centro illo distat [illegible] bus temporibus aequales conficere ponitur angulos. Nam [illegible] augeri et minui circuitum centri systematis planetarii [illegible] circuitum Terrae (Copernico) vel epicyclum sidus gestantem [illegible] quas haec, inquam, in astronomia sine exemplo novitas, [illegible] absurditas? Quin potius credi par erat, alibi Solem [illegible] centrum systematis planetarii (Tychonici) vel corpus [illegible] maeo) a suscepto aequalitatis puncto (quiescente apud Co[illegible] Tychonem, circumeunte in eccentrici circumferentia apud [illegible] longius distare, alibi brevius: [illegible] id procul dubio in [illegible] huic rei commodam occasionem videbatur suppeditare [illegible] meo Cosmographico derivata [illegible] theoriam, ut ita dicam, epicycli Ptolemaici) aequans [illegible]

[illegible]



[illegible]

[illegible] aequales. [illegible] quia CE major [illegible] angulo CFD. Propterea [illegible] contingere tantum in E vel vicinis [illegible] contrario [illegible] censebit totam [illegible] mensura CE, interdum angustiorem, [illegible] aliquis cum hactenus usitata astronomia [illegible] aequalis motus esse idem et centrum circuli [illegible]. [illegible] sit Terra in C: lineae medii motus Solis [illegible] (quod prius Copernico fuerant DC et EC) et sit centrum [illegible] epicyclicus regularis est, in F: et ipsi ED aequalis et [illegible] ducta CI sit parallelus ipsi DF et CH ipsi EF. Trans[illegible] visu in C centrum mundi, ut Ptolemaeo placet, [illegible] Mars in H, sic propter translatum D in C, transfertur [illegible] ergo existimans, F punctum, circa quod epicycli IH [illegible], esse etiam centrum epicycli IH, omnino FI et FH ponit [illegible] in anomalia coaequata utraque tam HFC quam IFC, [illegible] hoc schema) tam 90° quam 270°, unum et eundem [illegible] epicycli, nempe aequales angulos HCF et ICF. Quodsi [illegible] majorem esse HCF quam ICF, tum centrum epicycli [illegible] aequalis motus, sed in G versus H: et posito quod [illegible] epicycli esse putetur, omnino epicyclus auctus esse [illegible] 90° circa H, minutus in 270° circa I, Marte [illegible] in eodem loco [illegible] utrinque. [illegible] maneat C Terra, DE circulus Solis, centro B, [illegible] lineae, quibus planeta videtur (scilicet [illegible] in Ptolemaeo). Igitur ex H et I [illegible] ipsi [illegible] K et L sitque centrum systematis planetarii [illegible], versus perigaeum Solis, ut quando B versus [illegible] opinione descendit infra [illegible] centrum [illegible], tanto et M centrum circuitus KL (in quo [illegible] Martis [illegible]) descendat sub C: [illegible] linea [illegible] medii in [illegible] [illegible] sibi parallelae. [illegible] in [illegible] [illegible] [illegible] CLM, [illegible]

[illegible]

ibi brevis fit CK distantia centri systematis a Terra, ubi [illegible]
tantia Solis a Terra, et contra, illa CL longa, ubi [illegible]

Causa conversarum in hunc modum apsidum [illegible]
Copernico perambulat contrarias partes Soli Tycho[illegible]
Ptolemaico: et vero DC, CE, distantiae Terrae a So[illegible]
et Martis H vel I a centro F aequalitatis epicycli, [illegible]
omnes tres formas ejusdem quantitatis: ergo et distanti[illegible]
Copernicanae in contrarias plagas transferentur a Brahe[illegible]
nimirum CE in CL vel FH, et CD in CK vel FI. [illegible]

Ut igitur hanc speculationem observationibus vel confirm[illegible]
lerem, hanc viam insistebam. Cum apogaeum Solis sit in 5 1/2[illegible]
exstaret observatio, cum ♂ ratione primae inaequalitatis [illegible]
vel ♈: ☉ vero altrobique in 5 1/2° ♋, deinde in 5 1/2° ♑ [illegible]
possibile, ut fiat intra tam breve (20 vel 30 annorum) [illegible]
enim periodici Martis et Solis sunt incommensurabiles, [illegible]
in suas quartas vel opposita incidunt post peractos [illegible]
integros, eorumque dimidia et quartas. Oportuit igitur [illegible]
quaesito proximum, et multas constituere dies [illegible]
planeta est observatus, in quibus anomalia commutatio[illegible]
90° vel 270° vel proxime tanta, Marte in 5° ♈ vel [illegible]
Postmodum illos dies omnes oportuit in catalogum [illegible]
immittere, ut viderem, an etiam iis momentis [illegible]
frequentissime fuisset Mars observatus a diligentissim[illegible]
exquisita fuit haec electio, ut vel compos fieri non [illegible]
Tycho posuisset apogaeum ♂ in 23 1/2° ♌, requir[illegible]
per aequationem eccentri computus [illegible]
requirebatur 42°. Et cum [illegible] ipsius tabula [illegible]
aequatio 8° 15 1/2 [illegible] ergo requirebatur anomalia [illegible]
[illegible]
a 1579 in 1600. [illegible]

[illegible]

Si [illegible] coaequata anno 1591 erat 3s 25° 36′ 30″, qua arguebatur, [illegible] ante perigaeum epicycli 64° 23′ 30″. Aequalis igitur utrin- [illegible] angulus in schemate 74. ECD et ECE vel CFI, CFH. [illegible] 1585 Sol in 18° ♊. 18° ante apogaeum, anno 1591 in [illegible] perigaeum: quae inaequalitas caveri non potuit.

[illegible] observationes: anno 1585. d. 18. Maji h. 10½ noctis visus [illegible] ♍, cum lat. 1° 19′ 30″ borea. Maginus refert illum [illegible] igitur 14′ 15″. Ergo cum die 30. vesperi hora 6. [illegible] 48′ ♍, [illegible] auferemus, quod ante dies undecim [illegible] 6° 34′ ♍, ubi paucula scrupula ponemus in errore, [illegible] per dies 12, nec dicemus idem vere sit, qui [illegible] ex [illegible]; ut 18. Aprilis praecedente h. 10. inventus est ♂ in [illegible] Maginus ponit in 18° 0′ ♌, differentia 22½′, quae [illegible] ad 18. Maji per dies 33 imminuta fuit ad modulum 14⅓′. [illegible] proportionaliter, ut quia de differentia per 33 dies evanu- [illegible] ratione per dies sequentes 12 evanescent 3′, differentia [illegible] erit 11⅓′. Quare Mars correctius in 6° 37′ ♍.

[illegible] 22. Jan. mane h. 7 distabat ♂ a Spica ♍ 34° 32′ 45″ [illegible] 25′ austrina, in altitudine 16°. Ergo post cautas [illegible] declinatio 17° 30′. Hinc ascensio recta 230° 23′ 12″, [illegible], latitudo 1° 0′ 30″ borea. Distat vero tempus a [illegible] (ut) diurnis ex Magino est 33′. Ergo tempori inter- [illegible] Relinquitur ergo locus Martis ad 20. Jan. h. 0 (quod [illegible]) 21° 24′ ♏.

[illegible] temporibus CF est 13° 28′ [illegible] certo,
[illegible] CF anno 1585 . . . 6. 37 ♍

[illegible] FCI erit . . . 36° 31′.
[illegible] est anno 1591 . . . 13° 28′ ♎
[illegible] CH . . . 21. 24. ♏

[illegible] CFH erit . . . [illegible]

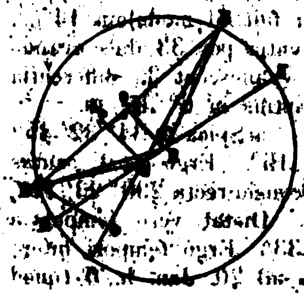
[illegible]

Caput XXIII [illegible]

Cognitis duabus distantiis Solis a Terra, et locis [illegible] Solis, inquirere eccentricitatem orbis Solis [illegible]

Hinc nobis non est difficile et [illegible] [illegible] FC 100000, *et quia* DFC *est* 95° 41′ [illegible] FDG *est* 78° 45′ 30″. *Et ut* [illegible] 100000, [illegible] DFC *ad* DG 61448. [illegible] *minus, et* FGE 64° 23′ 30″ [illegible] FEC 77° 8′ [illegible] 63196 *minus* *Exponatur orbis Terrae* NED [illegible] *apoideum, et* N *perihelium* [illegible] *centrum,* C [illegible] *loca duarum observationum* [illegible] *tum* C *et* [illegible] [illegible] 103° 47′ [illegible] DE [illegible] *quia sint* CP, BQ [illegible] CDO 38° [illegible] 61448 [illegible] DO [illegible] [illegible] DO [illegible]

Fig. 75.



25° 9′ 20″. *Quare* DE 142125, [illegible] *quia* DB, BE *aequales. Et quia* D [illegible] PDO 26° 3′ 21″. [illegible] DO [illegible] PD 54032: [illegible] QD, [illegible] [illegible] ED [illegible] *quia* CE *ad* [illegible] *in* 5° 30′ [illegible] *Sol die* 17° 52′ H [illegible] 17° 30′ [illegible]

[illegible]

[illegible] eccentricitatis in theoria Solis valere, quae prius etiam [illegible] in eccentrico Martis valuerat. Nam observationes a [illegible] scrupulosae (propter longas deductiones et [illegible]), ut de 45 particulis centies millesimis [illegible], ut taceam praecessionem temporis intermedii, [illegible] eccentrico Martis et Solis.

[illegible] Telluris demonstrata sunt, simili plane ratione et [illegible] et de Tychonico deferente systematis demonstrari [illegible] schemate, apsides in contrarias partes conver-[illegible] apogaeum Solis a Tychone loco justo con-[illegible] (seu Terrae), quam corpore peragrat, ordinari in [illegible] ad planetas ceteros diversum testabitur [illegible] deflexus plane nihil nostrae demonstrationi [illegible]

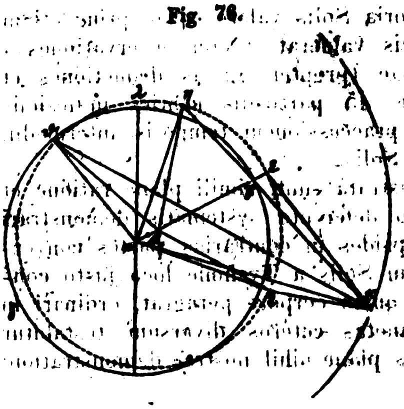
Caput XXIV.

[illegible] epicyclum seu orbem annuum esse a puncto [illegible] eccentricum.

[illegible] hujus inquisitionis, timida [illegible] et tam multis [illegible] aequalis haberetur [illegible] utraque [illegible] anomaliae com-[illegible] hujus, ut periculum faciamus audaciae subjecti [illegible] vel [illegible] planeta semper eodem eccentrici loco versante [illegible]

[illegible]

Fig. 76.



circulum [illegible] Sed in partes [illegible] Solis vergebat [illegible] gradum [illegible] sumus quasi [illegible] anno 1590 [illegible] ao 1593 [illegible] angulo [illegible] α est punctum [illegible] Martis tempore [illegible] lis. Atque [illegible] in κ, ejusque [illegible] ergo angulus [illegible] anomaliae commutationis [illegible] 127° 5′ 1″.

Quod visum locum Martis attinet, is die 4. [illegible] *fuit* 24° 22′ ♈, *diurnus ejus dici esset* 44. *Ergo* [illegible] *visus fuit in* 25° 6′ ♈, *qui est situs lineae* [illegible] 15° 53′ 45″ ♉. *Ergo θκα est* 20° 47′ 45″. [illegible] *duos rectos est* 32° 7′ 14″. *Et igitur sinus* [illegible] *esse partium* 100000, *sic sinus θκα ad* [illegible]

Quodsi reliquae ηα, εα, [illegible] ejusdem prodibunt [illegible] erit quod suspicor: ut si diversae [illegible]

Secundo igitur, anno 1592 [illegible] *coaequata* 1s 15° 55′ 23″: *commutatio coaequata* [illegible] est quam angulus est 24° 10′ [illegible]

[illegible]

[illegible] in 27° 59′ ♓	αθ	66774
[illegible] 6 ♒	αη	[illegible]
[illegible] 13 ♐	αε	[illegible]
[illegible] 20 ♏	αζ	67[illegible]8.

[illegible] quae et proxima perigaeo Solis; brevissima αθ, [illegible] a perigaeo Solis; et fere aequales αζ et αη, quia [illegible] absunt a perigaeo.

[illegible] est paulo quam αη, quae propior perigaeo? Id [illegible] in ζ tribuendum est, per quam facile tam parvum [illegible] Ergo circulus δγ, qui descriptus est a Copernico ex [illegible] motus Terrae, non est iter Terrae: sed est alius [illegible] in quo Terra versatur; cujus centrum vergit in [illegible] Sol est, scilicet in β.

[illegible] sit Tellus in A, Solis sphaera ΞΟΔΤ, K cen-[illegible]

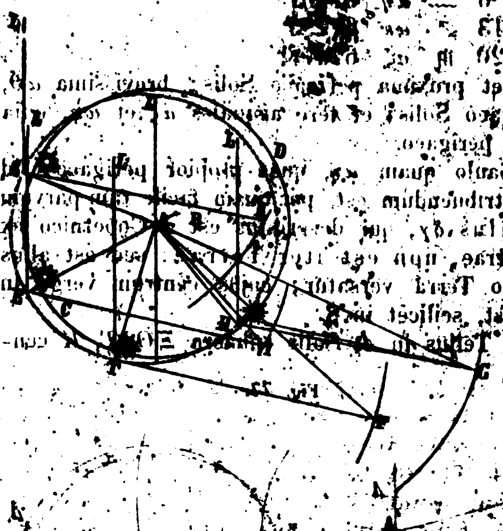
Fig. 77.



[illegible] Copernicana forma [illegible] paralleli prioribus [illegible]

[illegible]

Fig. 78.



et anguli LHG, LTF, LEI, LSK aequales [illegible] (Fig. 76), sic ut Mars ad nostra momenta sit [illegible] moneam, haec quatuor puncta G, F, I, K [illegible] aequalem et aequaliter [illegible] cum priori arcu [illegible] quia nulla amplius est differentia, quam [illegible] Solis aequalem in eccentrico circumfert, Tycho [illegible] seu in aequanti angulo ipsi epicyclo Ptolemaeus [illegible]

Rursum igitur manentibus [illegible] [illegible]

[illegible] Fig. 79. [illegible]

[illegible] et quantum [illegible]

[illegible] fixas, seu respectu

[illegible] et con-

[illegible] puncta sufficiunt

[illegible] datur latera et

[illegible] quaeritur $\vartheta\eta$ ostenditur

[illegible] 49169 in priori dimensione



[illegible] angulo $\alpha\varepsilon\eta$ quaeritur angulus [illegible] 68° 12′ 26″.

[illegible] angulo $\vartheta\delta\varepsilon$ quaeritur angulus $\alpha\varepsilon\vartheta$, inveniturque 46° 39′ 10″, [illegible] relinquit 21° 33′ 16″. Estque hic angulus $\vartheta\varepsilon\eta$ ad [illegible]. Duplum igitur ejus 43° 6′ 32″ erit $\vartheta\beta\eta$ angulus ad [illegible] circuli centrum. In $\vartheta\beta\eta$ igitur isoscele anguli [illegible] prius inventa, quaeritur $\vartheta\beta$ amplitudo radii circuli [illegible]. Et quia $\beta\vartheta\eta$ est 68° 26′ 44″: prius vero, cum $\vartheta\eta$ [illegible] 69° 18′ 46″; ergo $\beta\vartheta\alpha$ est 0° 52′ 2″. Igitur in [illegible] quaeritur $\vartheta\alpha\beta$ et $\alpha\beta$. Invenitur [illegible] 30″ [illegible] in 15° 8′ 30″ ♊: quia [illegible] Tycho vero [illegible] apogaeum Solis in 5½° ♋. [illegible] Tychonicam [illegible] 1520. [illegible] Eccentricitas vero [illegible] Solis est [illegible] vel 1800. Hic igitur [illegible] obser- [illegible] Quod facile patebit, [illegible]

[illegible]

simile est, majorem etiam habere, hoc est, Solis ...
tantum dimidia erit ejus, quae computatur ex ...
idem est, Sol utetur aequante, cujus eccentricitas ...
tatem eccentrici.

Fateor, argumentationem hanc de forma ...
imbecilliorem esse, quoad cum auctoribus meis Solis ...
itaque illustrior, ubi jam rationibus iis permotus, quae ...
sui, motum planetae ad Solis apparentem motum ...

Caput XXVI.

Demonstratio ex iisdem observationibus, ... axe, et orbem annuum (si, sic etiam viam ... circa Terram) a centro corporis Solaris ... dimidio saltem ejus, quod Tycho Brahe ... ...

Repetamus autem ipsas observationes diligenter ...
h. 7. 10' inventus est diligenti observatione ...
cum lat. 0° 3' 20" ... Ea hora occidit 8° ...
[illegible]

[illegible] Sequitur ergo tabella locorum

[illegible] Martis ex observatione; Solis ex calculo Tychonis.

[illegible]	[illegible]	♈	24° 0′ 25″	♓
[illegible]	[illegible]	♈	10. 17. 8	♒
[illegible]	4½	♈	25. 53. 24	♐
[illegible]	15. 42	♉	11. 41. 34	♏.

[illegible] nobis est explorare, quantum Terra ab ipso centro [illegible] prius oportebit nos uti hypothesi ex oppositionibus cum [illegible] loco, supra cap. XVI. exstructa, ad investigandum situm [illegible] ex centro Solis per corpus Martis in zodiacum educitur. In-[illegible] linea anno 1595. d. 25. Oct. h. 5. 45′ in 14° 19′ 52″ ♉. [illegible] reliquis toties per 1′ 36″ est loco anteriori: nempe [illegible] 18′ 16″ ♉; anno 1592. in 14° 16′ 40″ ♉; anno 1590.

[illegible] Schema primum in forma Copernici.

Fig. 80.



[illegible]

Tentabimus, quanta ex hisce distantiis [illegible]
si Solis theoria caret aequante, eccentricitas [illegible]
proxime, propterea quia usi sumus veris [illegible]
aequalitatis punctum tanto spatio (nempe 3600) a [illegible]
necesse est, ut Braheus ex observationibus [illegible]
minor prodibit eccentricitas et quam proxime [illegible]
evicimus, aequalitatis illud punctum, quod Braheus [illegible]
trum eccentrici Solis.

Vides autem (ut obiter admoneam) primo [illegible]
utpote circa perigaeum Solis: post $\alpha\epsilon$ longiorem, [illegible]
perigaeo: tum $\alpha\eta$, utpote 54° a perigaeo: denique [illegible]
80° abest a perigaeo. Ac cum $\alpha\zeta$ sit pene in perig[illegible]
longior brevissima. Sic cum $\alpha\delta$ sit prope longitudin[illegible]
minor mediocri distantia. Quare eccentricitas prodi[illegible]
1038, quae differentia est inter $\delta\alpha$ et $\zeta\alpha$. Et si [illegible]
100000, tunc 1038 valebit 1539: et tanta fere [illegible]
eccentricitas. Id autem multo propius est [illegible]
integrae 3600.

Eadem de apogaeo Solis dicenda. Nam [illegible]
perigaeum est circa 25° 53′ ♐. Et quia $\epsilon\alpha$ [illegible]
gaeum est propius apud 10° 17′ [illegible]
est 25° 57′ ♐. Ergo perigaeum [illegible]
scilicet in ♑.

Haec in solatium [illegible]
geometrica locum apogaei et eccentricitatem [illegible]
ponant circulum, utar initio punctis [illegible]

Igitur argumentor ut supra cap. XXV. [illegible]
in eadem circumferentia, cujus [illegible]
de angulo [illegible]
radium et [illegible] eccentricitatem [illegible]
[illegible] Ad [illegible]

[illegible]	38° 51′ 0″	Et quia $\alpha\delta\zeta$	45° 27′ 22″
[illegible]	[illegible] 8. 12	[illegible] $\gamma\delta\zeta$	[illegible] 17. [illegible]
[illegible]	[illegible] 12. 12	ergo $\gamma\delta\alpha$	[illegible] 26
[illegible]	[illegible] 24. 24	Relinquitur γ, α	1[illegible]. [illegible]. 34
[illegible]	[illegible] 35. [illegible]	Dimidium	80. 19. [illegible]
[illegible]	48. 47. 48	Tangens	[illegible]
	72[illegible]	Sumatur $\gamma\delta$ esse partium	100000
[illegible]	[illegible]	erit earum partium $\alpha\gamma$	[illegible]
		Hinc [illegible] $\delta\gamma\alpha$	[illegible]
		et [illegible] $\alpha\gamma$ [illegible]	[illegible]
		Sinus vero $\delta\alpha\gamma$	[illegible]
		et sinus $\gamma\delta\alpha$	[illegible]
		ostendunt $\alpha\gamma$ eccentricitatem	2518. [illegible]

[illegible] eccentricitatem ex δ et ζ prodire, paulo majorem [illegible] quod ζ est proximum perigaeo. Cum autem hic (pro [illegible] [illegible]) prodeat eccentricitas longe major, innuitur igitur [illegible], esse aliquam in perigaeo, quae sit ipsa $\alpha\zeta$ [illegible] [illegible] ut haec in perigaeo brevior esse posset, quam $\alpha\zeta$ pen[illegible] [illegible], hoc est longius ab $\alpha\zeta$ per hanc argumen[illegible] [illegible] Solis perigaeum non esse in 16° ♑ sed in 6° ♑ [illegible] eccentri in γ puncto, et linea [illegible] nimis longa; [illegible] [illegible] $\zeta\alpha$ prodiret nimis amplus, et $\delta\eta$ radius ejus nimis [illegible] longe, et γ recta a linea $\delta\gamma$ discederet, obliqueque [illegible] jam $\gamma\alpha$ linea vergat nimis in consequentia. Manenti[illegible] [illegible] centrum ad lineam $\delta\alpha$ recta [illegible]. Et quia γ accedit ad $\delta\gamma$ perpendiculariter [illegible]

[illegible]



[illegible]

Quare $\beta\eta\zeta$ 43° 22′ 26″ ... $\gamma\delta\zeta$ 46° 37′ 34″, *et* $\gamma\delta\alpha$ 1° 10′ 12″; ... *est* 100000, *talium erit* $\alpha\delta$ 99416 *et* $\delta\gamma\alpha$ ... *in* 10° 30′ ♑, *et eccentricitas adhuc* 21...

Sicut igitur cum accessione ad ... ita uti plane ad justum perigaeum ... tionem eccentricitatis accedamus. Sed juvat ... praesciamus mutatione lineae $\alpha\theta$, nempe unius ... Martis eccentricum computatum, manente ... puncto θ immutabili. Promota igitur $\alpha\theta$, ... visionum $\eta\theta$, $\zeta\theta$ et reliquae, fieret ut $\alpha\theta$ ... quam est θ: vicissim a $\zeta\theta$ et sociis ... Ita $\alpha\theta$ non retineret eandem longitudinem. ... omnibus quatuor vicibus in eodem loco ... vicibus ipsius $\alpha\theta$ eadem longitudo, ... θ et tamen lineae visionis in pristina ... $\eta\theta$ parallelum ducere paulo inferiorem, ... exteriorem et parallelum, quo ... labor est repetendus a principio. ...

[illegible]

[illegible] usque ad 1800. [illegible] in 5½° ♉.
[illegible] *Prolongatur autem* [illegible]
[illegible] : *tunc enim* [illegible] *per operas*
[illegible] *aliquis interior ipso* [illegible]

[illegible] hanc libertatem mutandi minima in datis suspectam habet, [illegible] libertate mutandi ea, quae nobis in observationibus non [illegible] Tychonis eccentricitatem tandem obtineri posse: hujus[illegible] periculum faciat, et ubi suas mutationes cum nostris [illegible] ferat, utra mutatio intra sensuum defectum con[illegible]: [illegible] ne fiducia unius hujuscemodi processus elatus [illegible] tanto turpiorem det, diversissimis Solis apogaeis inventis. [illegible] mea praejudicia et affectationes hic in aperto posui, [illegible] importunus, quam ne parum fidus lectori videar.
[illegible] aliter dicendum, in futurum usum, si $\gamma\delta$ fiat 100000, [illegible], et majorem etiam, ubi quae adhuc desiderantur,

[illegible] si $\alpha\theta$ sit 147700, et eccentricus locus Martis [illegible] 7″ ♉, et eccentricitas Terrae 1800, et iter Terrae [illegible] XXX, et XLIV: prodibunt visiones

	24° 21′ 13″ ♈	Deb. 24. 20
	9. 23. 20 ♈	9. 24
[illegible] circiter 147750.	3. 2. 30 ♈	3. 4½
	19. 42. 40 ♉	19. 42

[illegible] circiter 1800, cum deberet [illegible] formae Copernicanae [illegible] Solis [illegible]

[illegible]

Solis. Ergo $\vartheta \nu o$ linea semper parallelos [illegible]
et parallaxes diurnas Martis in ea proportione [illegible]
sunt a Tychone proditae, retinendae [illegible]
theoriae Solis: propterea et ϑo aequalis eccentricitati [illegible]
Sol movetur aequaliter. Sed et in partes easdem [illegible]
Sol in suo circulo secundum Ptolemaeum: et [illegible]
respondentibus in locis uterque reperiuntur, Sol in [illegible]
in suo epicyclo; sic ut lineae ex τ per Solem et [illegible]
[illegible] sint paralleli, docente eodem Ptolemaeo. [illegible]
[illegible], cur non et hoc consentiat, ut, quia [illegible]
sed circa o punctum superius aequaliter movetur, [illegible]
stratum est transposita eccentrici terrestris [illegible]
puncto nacti sumus ϑ, pro γ, ϑ, et pro α, [illegible]
sint divisa, ita ut $\alpha\psi$ eccentricitas, quae ex Solis [illegible]
venitur, bisecanda sit in [illegible], et sit [illegible] centrum [illegible]
tali processu Ptolemaeus utitur, ut appareat, si [illegible]
eadem omnino etiam eadem eccentricitate [illegible]
quam in Sole deprehenderat. Testantibus igitur [illegible]
epicycli Ptolemaicae eccentricitate (quia propter [illegible]
diximus) eadem triangula manent, quae erant in [illegible]
nos Ptolemaei sequimur etiam Solis eccentricitatem [illegible]
$\lambda\varepsilon$, $\rho\kappa$, $\upsilon\lambda$, $\upsilon\mu$ paralleli maneant.

Hac itaque ratione etiam Ptolemaeo [illegible]
[illegible] Solis a Tychone [illegible]
[illegible] in [illegible]

[illegible]

[illegible] paralleli sunt. At de [illegible] proprie [illegible] quia ejus [illegible] ducitur, quae [illegible] posita fuit, non [illegible] [illegible] ejici posse per centra duorum reliquo- [illegible] quae dicantur lineae apogaei proprie; [illegible] puta [illegible] in 24° [illegible], [illegible] in 19° [illegible] [illegible] per cujusque eccentrici punctum [illegible]. Itaque si quis ex Ptolemaei sectatoribus non [illegible] eccentrico in puncto ϑ, sed mavult eum alligare in centro γ, [illegible] lineis apsidum, altera $\alpha\varphi$ eccentrici, reliqua $\alpha\psi$ [illegible] $\alpha\varphi$ et $\alpha\psi$; quod quam sit intricatum et in- [illegible] absurditate enim sat dictum est capite VI.), judicet hujus- [illegible]

[illegible] quis velit [illegible] epicyclum eccentrico in puncto o, circa [illegible] aliter volvitur. Nam tunc eccentricus, deferens punctum o, [illegible] lineis [illegible] igitur vel epicyclum in [illegible] figere, [illegible] apogaea improprie sumere, [illegible] computare [illegible] ab α, Terrae indice.

[illegible] prima delineatio fuit in forma [Ptolemaica]. Altera [illegible] Terrae Copernicana [illegible] concedant non in α, [illegible] non α, sed γ denotet Terram mundi cen- [illegible]

[illegible]

geram incidentibus, pariter apogaeum [illegible] velocitas, pares ambitus describentibus, [illegible] versas a Terra egressiones in plagam eandem [illegible]

Atque hactenus hanc demonstrationis formam [illegible] proposuisse sufficiat. In posterum, quoties eadem [illegible] utar solius Copernici ut simpliciori forma, [illegible] autem vidit lector industrius, quomodo [illegible] formam vel Ptolemaicam vel Copernicanam [illegible] manifestasit.

Caput XXVII.

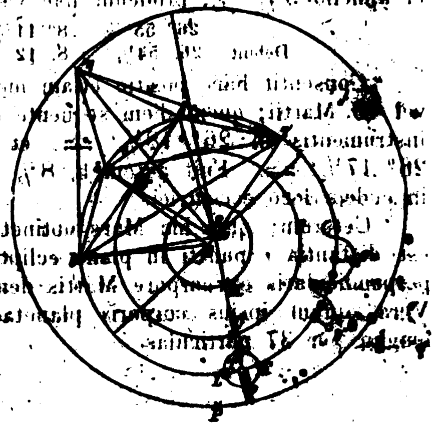
Ex aliis quatuor observationibus stellae Martis [illegible] in eodem tamen eccentrici loco, demonstrare [illegible] cum ejus aphelio, et proportionem orbium ejus [illegible] eccentrico [illegible]

Hactenus fere [illegible] aphelio Martis [illegible] medii et hypothesi [illegible] in [illegible] longitudine [illegible] in hoc [illegible]

[illegible]

20. 20	00291

Fig. 61.



[illegible] super $\zeta\varepsilon$ arcu stant [illegible] circumferentiam circuli, [illegible] oportet hos aequales [illegible], et ut aequales [illegible] super α sub [illegible] mutanda est. [illegible] positione ipsi [illegible] dictus est, ergo [illegible] $\zeta\gamma\varepsilon$ possint aequales [illegible] positionem ipsius [illegible]

[illegible] $\vartheta\alpha\varepsilon$, $\delta\alpha\gamma$, $\zeta\alpha\gamma$,

[illegible] $\zeta\delta\alpha$, $\varepsilon\delta\alpha$, $\varepsilon\gamma\alpha$, $\zeta\gamma\alpha$,
$\varepsilon\delta\zeta$, $\varepsilon\gamma\zeta$.

[illegible] horum [illegible] dantur anguli ad α per loca, [illegible] correctionem per praecessionem aequinoctiorum [illegible] comprehensa [illegible]

[illegible] 19. 6' [illegible]

[illegible] per $2\frac{1}{2}'$, [illegible] capite XXII. [illegible] fit per [illegible]

Rursum admodum propinque dimidium ipsius [illegible] cui dubio plane assequemur, nisi et ipsissimum [illegible]

Sciendum tamen est, si ponamus, viam [illegible] sed angustiorem ad latera, prodire hic [illegible] paulo [illegible] Et tunc 1½′ ablatis a loco eccentrici, et usurpata [illegible] et aphelio 5½° ♑, prodeunt hae visiones:

	26° 55′ ♌	8° 11⅔ [illegible]	8° 4[illegible]
Debuit	26. 54½	8. 12	8. 4[illegible]

Consentit haec positio etiam meis observatis [illegible] vel [illegible]. Martii; quem diem sequente nocte culminant[illegible] instrumentis [illegible] 26° 18⅓′ ♎, et his assumtis ca[illegible] 26° 17½′ ♎. Fuit autem h. 8⅔ paucis horis [illegible] in eodem loco eccentrici.

Ceterum, quia hic Mars obtinet latitudinem, [illegible] est distantia η puncti in plano eclipticae a centro [illegible] perpendicularis ex corpore Martis demittitur, ut supra [illegible] Vera autem ipsius corporis planetae a centro Solis [illegible] longior per 37 particulas.

Caput XXVIII.

[illegible] 1800 [illegible] loco [illegible] 1800 [illegible]

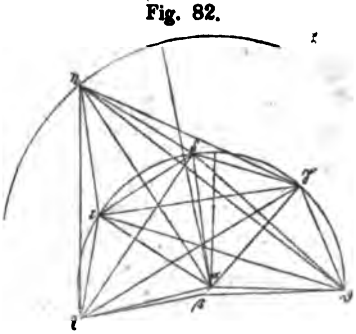
[illegible]

haec momenta, quibus adscripta loca Solis requisita, et distantiae Solis et Terrae ex hypothesi hactenus stabilita computatae. Sunt autem eae ipsae, ob quas probandas hunc laborem suscipimus. Porro artificium computandi hasce distantias paulo post sequetur cap. XXX.

							Distantiae Solis et Terrae.
1583.	23. Apr.	h. $8^1/_{10}$ a. m.;	♂ in 1° $29^1/_2$′	♌	☉ in 12° 10′ 3″	♉	101049
1585.	10. Mart.	h. $7^2/_3$ „ „	„ „ 11. $48^1/_3$	♌	„ „ 29. 41. 4	♓	99770
1587.	26. Jan.	h. $7^1/_6$ „ „	„ „ 4. $41^3/_4$	♎	„ „ 16. 5. 55	♒	98613
1588.	13. Dec.	h. $6^3/_4$ „ „	„ „ 13. $35^2/_3$	♎	„ „ 1. 44. 53	♑	98203
1590.	31. Oct.	h. $6^3/_4$ „ „	„ „ 2. $57^1/_3$	♎	„ „ 17. 28. 33	♏	98770

Quod observationum deductionem attinet ex diebus observationum ad nostra momenta, primo tempore diurnus ex Magino fuit transsumtus, cum in spatio paucarum horarum non sit periculum erroris. Cetera tempora observationibus ante et post sunt munita. Tempore tamen penultimo inspexi etiam seriem diurnorum in Magino: nam versus 15. Dec. diurnus fuit 30′, circa 5. Dec. 32′. Ultimo tempore etsi Mars in altitudine 23° refractionibus est obnoxius, ita ut facile 2′ in latitudine desiderari possint (nam Tycho contendit, refractiones fixarum, planetis etiam adhibendas, desinere quidem in hac altitudine, Solares vero altius pertingere esseque in hac altitudine circiter 4′, quae distinctio ventilata et conquassata est in Astronomia mea Optica fol. 137 (214) et amplius etiam redderetur dubia, si quid esset in parallaxibus Solis mutandum): tamen haec refractio parum nocet longitudini Martis.

Fig. 82.



Sit α corpus Solis, $\alpha\beta$ eccentricitas orbis Terrae 1800, et linea augium in $5^1/_2$° ♋, loca Terrae ζ, ε, δ, γ, ϑ, et corpus planetae quinquies in η, eodem loco eccentrici, utpote post integras Martis periodos. Et connectantur puncta omnia. Lubet inquirere $\alpha\eta$, ejusque locum sub zodiaco, hoc est angulum $\eta\alpha\vartheta$, $\eta\alpha\gamma$, vel aliquem alium ad α. Id faciemus ex binis Terrae locis in hunc modum. *Sint primum ε, δ. Et in triangulo $\varepsilon\alpha\delta$ datis lateribus, $\varepsilon\alpha$ 99770, $\alpha\delta$ 98613 et angulo $\varepsilon\alpha\delta$, quaerantur reliqua, anguli scilicet δ, ε, et latus $\delta\varepsilon$.*

	29°	41′	4″	♓
	16.	5.	55	♒
	43.	35.	9	
Praecessio		1.	36	
$\varepsilon\alpha\delta$	43.	36.	45	

Prodeunt $\alpha\delta\varepsilon$ 69° 1′ 41″ $\alpha\varepsilon\delta$ 67° 21′ 35″ *et* $\delta\varepsilon$ 73700.

His investigatis ad triangulum $\varepsilon\eta\delta$ ascenditur.

Cum enim sit $\varepsilon\alpha$	29°	41′	4″	♓	$\delta\alpha$	16°	5′	55″	♒
et $\varepsilon\eta$	11.	48.	20	♌	$\delta\eta$	4.	41.	45	♎
Erit $\alpha\varepsilon\eta$	132.	7.	16		$\alpha\delta\eta$	131.	24.	10	
Sed jam fuit $\alpha\varepsilon\delta$	67.	21.	35		$\alpha\delta\varepsilon$	69.	1.	41	
Ergo residuus $\eta\varepsilon\delta$	64.	45.	41		$\eta\delta\varepsilon$	62.	22.	29	

Horum residuum ad duos rectos $\varepsilon\eta\delta$ 52° 51′ 49″ (50″).

Datis ergo angulis ε, η, δ, *et uno latere* $\varepsilon\delta$, *dabitur et latus* $\varepsilon\eta$ = 81915.

Denique et triangulum $\eta\varepsilon\alpha$ *solvatur, in quo dantur jam* $\varepsilon\eta$ 81915, $\varepsilon\alpha$ 99770 *et* $\iota\varepsilon\eta$ *ut prius* 132° 7′ 16″. *Ergo* $\varepsilon\alpha\eta$ 21° 26′ 32″ *et* $\alpha\eta$ *quaesita* 166208.

Solis. Ergo $\vartheta \nu o$ linea semper parallelos [illegible] et parallaxes diurnas Martis in ea proportione [illegible] sunt a Tychone proditae, retinendae [illegible] theoriae Solis: propterea et ϑo aequalis eccentricitati [illegible] Sol movetur aequaliter. Sed et in partes [illegible] Sol in suo circulo secundum Ptolemaeum: et [illegible] respondentibus in locis utrerque reperiuntur, Sol in [illegible] in suo epicyclo, sic ut lineae ex τ per Solem et [illegible] [illegible] sint paralleli, docente itidem Ptolemaeo. [illegible] [illegible], cur non et hoc consentiat, ut, quia [illegible] sed circa o punctum superius aequaliter movetur, [illegible] [illegible] est transposita eccentrici terrestris in [illegible] puncto nacti sumus ϑ, pro γ, ϑ, et pro [illegible] sint divisa, ita ut $\alpha\psi$ eccentricitas, quae [illegible] venitur, bisecunda sit in [illegible], et sit [illegible] centrum [illegible] tali processu Ptolemaeus utitur, ut apparet, si [illegible] [illegible] eandem eccentricitate [illegible] quam in Sole deprehenderat. Testantibus igitur [illegible] epicycli Ptolemaici eccentricitate (quia [illegible] [illegible], eadem triangula manent, quae erant in [illegible] non Ptolemaei [illegible] etiam Solis eccentricitatem [illegible] $\lambda\varsigma$, $\rho\alpha$, $\upsilon\lambda$, $\nu\mu$ paralleli maneant.

Hac itaque ratione etiam Ptolemaeo [illegible] [illegible] a Tychone [illegible]

[illegible]

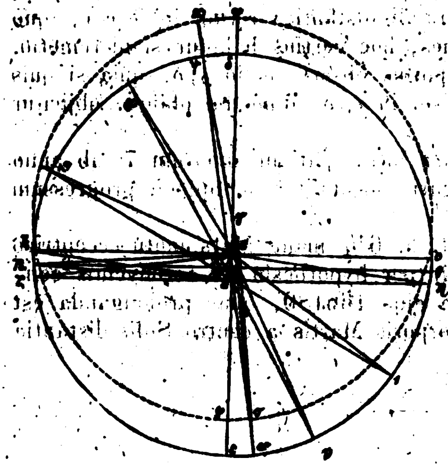
[illegible] paralleli sunt. At [illegible] proprie [illegible] praeterquam [illegible] quia ejus [illegible] Terram ducitur, quae [illegible] posita fuit, non [illegible]

[illegible] Terra ejici posse per centra [illegible] reliquo- [illegible] rectas, quae dicuntur lineae apogaei proprie; [illegible] apogaei $\alpha\chi$, puta [illegible] in 24° ♌, α [illegible] in 19° ♌ [illegible] lineas non transibunt per cujusque eccentrici punctum [illegible]. Itaque si quis ex Ptolemaei sectatoribus non [illegible] eccentrico in puncto θ, sed mavult eum alligare in centro ν, [illegible] lineis apsidum, altera $\alpha\varphi$ eccentrici, reliqua $\alpha\psi$ [illegible] $\alpha\varphi$ et $\alpha\psi$; quod quam sit intricatum et in- [illegible] absurditate enim sat dictum est capite VI.), judicet hujus- [illegible]

[illegible] quis velit figere epicyclum eccentrico in puncto o, circa [illegible] aliter volvitur. Nam tunc eccentricus, deferens punctum o, [illegible] eccentricitates, alteram [illegible] in linea [illegible], alteram [illegible]. Licet igitur vel epicyclum in [illegible] figere, [illegible] puncto ν et o defesunt, apogaea improprie sumere, [illegible] computare [illegible], [illegible] ab α, Terrae indice.

[illegible] prima delineatio fuit in forma Ptolemaica. Altera [illegible] Terrae Copernicana δ, [illegible] γ, concedant non in α, [illegible] schemate non α, sed γ denotet Terram mundi cen- [illegible] punctorum δ, [illegible] tres eccentrici [illegible] $\alpha\gamma$, eritque mera [illegible] lineas rectas [illegible] curiosi [illegible] punctum [illegible] sit in [illegible] et paralleli $\iota\lambda$, $\varkappa\varrho$, $\lambda\zeta$, $\mu\nu$, [illegible] circumferentia, quam [illegible] facit [illegible]

Fig. 33.



demonstra[illegible]
confusionem [illegible]
generali [illegible]
est ac si dic[illegible]
movere inaequ[illegible]
κυκλῳ, contro [illegible]
aequali ipsi [illegible]
a centro epic[illegible]
esse arcubus [illegible]
Sole) desc[illegible]
Sol) et [illegible]
inaequalitas [illegible]
et sic [illegible]
veloces. Phy[illegible]
hypotheses [illegible]
differam.

Nunc his [illegible]
opus accedam [illegible]

et $\beta\alpha$ 1800, *et* $\alpha\beta\delta$ *recta, per additionem igitur* [illegible] *distantia aphelia; et quia etiam* $\beta\alpha$ 100000 [illegible] $\alpha\varepsilon$ *perihelia.*

Et quia $\beta\alpha\zeta$ *rectus et* $\zeta\beta$ 100000, *hoc est* [illegible] *sinus aequalis* $\alpha\zeta\beta$, *igitur* $\alpha\zeta\beta$ *est* [illegible] *vel Terrae optica.* Nam aequatio quidem [illegible] quae ex parte optica et physica composita [illegible] (seu 3562) pro sinu habet $\zeta\alpha$ ut Sol vel Terra [illegible] quidem dies adjecerit quantae parti [illegible] solus dici iter supra quartam partem [illegible] hoc spatio, vel quodlibet temporis [illegible] diem diutius debito [illegible]

Sed ad [illegible]

[illegible]

[illegible] et connectantur μ, ν cum β. Cum ergo $\varkappa\alpha\beta$ sit graduum [illegible] erit et residuus $\varkappa\beta\alpha$, eique aequalis $\mu\alpha\delta$ integrorum [illegible] $\beta\varkappa\alpha$, $\beta\lambda\alpha$ similibus aequale erit latus $\varkappa\alpha$ lateri [illegible] Est autem $\lambda\beta$ sinus anguli $\lambda\mu\beta$, [illegible] et ipsius $\lambda\mu\beta$ [illegible] $\lambda\beta\nu$; ejusque sinus linea $\lambda\mu$, $\lambda\nu$; et ipsarum [illegible] [illegible] quantitates $\lambda\alpha$, $\lambda\beta$ jam inventae sunt in triangulis [illegible] [illegible] ope quatuor inveniri possunt distantiae [illegible] [illegible] a linea apsidum ejusque perpendiculari $\zeta\eta$ per [illegible] [illegible] aequalis ipsi $\vartheta\alpha\delta$ et $\nu\alpha\eta$ ipsi $\iota\alpha\varepsilon$. Est itaque [illegible] in δ, brevissima in ε, mediocris vero et aequalis ipsi $\beta\zeta$ [illegible] in linea per β, ipsi $\zeta\alpha$ parallelo, quae sit ξo. Nam [illegible] $\beta\zeta$, eo quod minori $\zeta\beta\alpha$ subtendatur quam est [illegible] [illegible] longior est quam $\beta\xi$, eo quod majori $\xi\beta\alpha$ (su-[illegible] [illegible]datur, $\xi\beta$ vero minori $\xi\alpha\beta$.

[illegible] distantiae mediae locus geometrice designetur, bisecetur $\alpha\beta$ [illegible] perpendicularis ipsi $\alpha\beta$ agatur $\pi\varrho$, secans circulum in [illegible] signa aequaliter ab α et a β distantia. Connectatur [illegible] cum α et cum β, erunt $\pi\alpha$, $\pi\beta$ aequalibus (ut-[illegible] $\pi\sigma\beta$ subtensae, et $\alpha\sigma$, $\sigma\beta$ aequales, et $\pi\sigma$ [illegible] [illegible] aequales. Et sic Reinholdo usurpata demonstratio [illegible] puncto β, vera manet de puncto σ et dimidia $\alpha\beta$. [illegible] cogitare, cum in π distantia [illegible] fiat aequalis ipsi [illegible] etiam [illegible] majorem esse ipsa $\beta\zeta\alpha$, [illegible] ma-[illegible] contingere, argumento [illegible] quod recta $\beta\alpha$ ipsi [illegible] [illegible] ipsi [illegible] Atqui verum non est, [illegible] [illegible] obliquius $\beta\alpha$ respicit ζ [illegible] longius [illegible] [illegible] longior quam [illegible] major enim [illegible] quam [illegible]

[illegible] Ptolemaeus et ex eo Reinholdus in Theoricis [illegible] quidem [illegible] contingere [illegible] in forma [illegible]

[illegible]

Caput XXX.

Tabula distantiae Solis a Terra [illegible]

In hunc modum exstructas distantias Solis [illegible] anomaliae coaequatae totius semicirculi (nam quae in [illegible] aequaliter ab apogaeo distantes cum his, aequales [illegible] jecimus hic in tabellam, cujus columnae tres sunt. [illegible] mus anomaliam mediam, sunt anguli $\delta\beta\mu$, $\delta\beta\theta$, [illegible] ex $\delta\alpha\mu$, $\delta\alpha\theta$, $\delta\alpha\xi$, $\delta\alpha\iota$, $\delta\alpha\nu$ integrorum graduum [illegible] tionibus opticis seu eccentri, puta $\beta\mu\alpha$, $\beta\theta\alpha$, $\beta\xi\alpha$ [illegible] distantiae ipsae $\alpha\mu$, $\alpha\theta$, $\alpha\xi$, $\alpha\iota$, $\alpha\nu$ collocantur e [illegible] titulo anomaliae coaequatae collocantur anguli hic [illegible] originis ratio partim jam statim, partim capitibus [illegible] Existunt autem per subtractionem aequationum [illegible] $\delta\alpha\mu$ etc. Itaque ipsis $\delta\alpha\mu$ angulis integrorum gra[illegible] columnam, quia sunt medium arithmeticum inter [illegible] angulos et sic se ipsis facile intelliguntur, nec [illegible]

Ingressus ergo cum anomalia media vel [illegible] utralibet in sua propria columna quaesita, vel cum [illegible] ad integrum circulum, ubi semicirculum ipsa [illegible] Solis a Terra quaesitam, in partibus qualium [illegible] eccentricitas 1800. [illegible]

Verum sat, quod hoc pacto (cum distantia [illegible] angulo, qui tanto est minor quo $\delta\alpha\xi$, [illegible] affingitur circuitui Terrae (vel Solis) circa [illegible] cialis. Nam quia (exempli gratia) distantia [illegible] $\delta\alpha\xi$ 90° integrorum, et positum sit [illegible] maliam coaequatam, jam vero juberis distantiam [illegible] [illegible] quae in nostra tabula coaequatae [illegible] [illegible] per 90 [illegible]

[illegible]

[illegible] quantitatem attinet, excedit medicina modum. Nam ano-[illegible] 55° 38′ 7″, cui media respondet 91° 1′ 53″, non debuit [illegible] 100000, quod est medium inter schematis et inter [illegible] Causa hujus affirmati differenda est in cap. LV. et

[illegible] jam est, nos nihil sensibile aberraturos, si 3[illegible] particulis [illegible] minus igitur nocebit nobis ad sensum, si solum dimidio, [illegible] erremus. Itaque interim hunc errorculum tuto admit-[illegible] ejus, qui hucusque legendo provectus est, accom-[illegible] praesupponere videamur, quod erat demonstrandum.

[illegible]	Anomalia coaequata.	Anomalia media.	Distantia.	Anomalia coaequata.
[illegible]	0° 0′ 0″	45° 48′ 46″	101265	44° 16′ 15″
[illegible]	0. 56. 55	46. 44. 30	101242	45. 15. 30
[illegible]	1. 57. 50	47. 45. 15	101219	46. 14. 45
[illegible]	2. 56. 46	48. 45. 50	101195	47. 14. 1
[illegible]	3. 56. 42	49. 46. 42	101172	48. 12. 18
[illegible]	4. 54. 37	50. 47. 24	101147	49. 12. 36
[illegible]	5. 55. 32	51. 48. 5	101123	50. 11. 55
[illegible]	6. 52. 29	52. 48. 46	101098	51. 11. 14
[illegible]	7. 51. 24	53. 49. 25	101073	52. 10. 35
[illegible]	8. 50. 20	54. 50. 3	101047	53. 9. 56
[illegible]	9. 48. 16	55. 50. 41	101022	54. 9. 19
[illegible]	10. 46. 12	56. 51. 16	[illegible]	55. 8. 42
[illegible]	11. 47. 5	57. 51. 54	[illegible]	56. 8. 6
[illegible]	[illegible]	58. 52. 30	[illegible]	57. 7. 31
[illegible]	[illegible]	59. 53. [illegible]	[illegible]	58. 6. 57
[illegible]	[illegible]	60. 53. [illegible]	[illegible]	59. 6. 25
[illegible]	[illegible]	61. 54. 27	[illegible]	60. 5. 53
[illegible]	[illegible]	[illegible]	[illegible]	61. 5. 22
[illegible]	[illegible]	[illegible]	[illegible]	62. 4. 59
[illegible]	[illegible]	[illegible]	[illegible]	63. 4. 29
[illegible]	[illegible]	[illegible]	[illegible]	64. [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	65. [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	66. [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	70. 1. [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	100550	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible] 15

Anomalia media.	Distantia.	Anomalia coaequata.	Anomalia media.
91° 1′ 53″	99984	88° 58′ 7″	136° [illegible]
92. 1. 51	99952	89. 58. 9	137. [illegible]
93. 1. 49	99921	90. 58. 11	138. 41. 24
94. 1. 45	99890	91. 58. 14	139. 40. [illegible]
95. 1. 43	99858	92. 58. 17	140. 39. 47
96. 1. 38	99827	93. 58. 22	141. 38. [illegible]
97. 1. 32	99796	94. 58. 28	142. 38. [illegible]
98. 1. 25	99765	95. 58. 35	143. 37. [illegible]
99. 1. 16	99734	96. 58. 44	144. 36. [illegible]
100. 1. 7	99703	97. 58. 53	145. 35. [illegible]
101. 0. 57	99672	98. 59. 3	146. 34. [illegible]
102. 0. 45	99641	99. 59. 15	147. [illegible]
103. 0. 31	99610	100. 59. 29	148. [illegible]
104. 0. 18	99580	101. 59. 42	149. 31. 52
105. 0. 2	99549	102. 59. 58	[illegible]
105. 59. 46	99518	104. 0. 14	[illegible]
[illegible] 59. 29	[illegible]	105. 0. 31	[illegible]
107. [illegible] 11	[illegible]	106. [illegible] 29	[illegible]
108. [illegible] 51	[illegible]	107. 1. [illegible]	[illegible]
[illegible]	[illegible]	108. 1. 30	[illegible]
[illegible]	99370	109. 1. 54	[illegible]
[illegible] 57. 45	[illegible]	110. 2. 14	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

Fig. 34.



[illegible] eccentricitas 3600 in AF linea [illegible] CE, CD radii orbis: et sit FAE [illegible] AD 135°. Perspicuum autem est, quanta[illegible] fore circa haec anomaliae loca [illegible] in longitudinibus mediis plane eaedem [illegible], cum 3600 tam in sinubus quam in [illegible] eandem arcum exhibeat. Ut ergo CE [illegible] CAE vel CAD sinum, sic CA eccentricitas [illegible] aequationem, quae est utrinque 1° 27′ 31″. [illegible] computavit Ptolemaeus aequationes [illegible] Copernicus, ex iis Braheus; qui[illegible] AC tanta, quantam inveniebat ex [illegible]

[illegible] secundus modus computandi easdem aequationes, quo Pto[illegible] in planetis ceteris, et quo utendum est mihi, qui hac parte [illegible] centrum eccentrici non esse in C puncto aequalitatis motus, [illegible] A centrum mundi et C aequalitatis punctum intermedii. [illegible] CA in B, et sit EB, BD radius orbis, eritque eadem [illegible] BEA, BDA 0° 43′ 46″, qui additus ad EAB, DAB, [illegible] 43′ 46, DBC 135° 43′ 46″. Quare ex lateribus et [illegible] BEC 43′ 38″, BDC 43′ 42″, et sic totus CEA [illegible] CDA 1° 27′ 28″ ad unguem idem cum priori. Itaque [illegible] Tychonis Brahei appendice pag. 821, ubi calculi utriusque [illegible] (lege [illegible]). Atque haec secundum doctrinam [illegible] forma.

[illegible] sint aequales aequationis partes in hac [illegible] forma (pars enim optica fuit 43′ 46″, [illegible] 43′ 42″): hinc tibi causa patet, cur prae[illegible] tabulae nihil aliud quam prosthaphaeresin [illegible] constituenda, qui tertius modus est [illegible]. Nam in apogaeo et perigaeo utraque [illegible] longitudinibus [illegible] aequales sunt [illegible] circulum [illegible], ubique [illegible]: quas si major [illegible]

[illegible] hypothesin, [illegible] capitibus octo, ut [illegible]

multoque certius apparebit infra cap. XLII. Porro [illegible]
imitatus quam proxime. Jam et in theoria Solis [illegible]
(Copernico) idem est demonstratum. De Venere [illegible]
idem credamus nihil impedit. Imo jam demonstra[illegible]
esse opinionem, horum planetarum centra eccentrici [illegible]
cumire. Omnes ergo planetae hoc habent. Cum [illegible]
Cosmographico, ante annos octo (plures jam [illegible]
de causa aequantis Ptolemaici hoc solo nomine [illegible]
nomia vulgari dici non posset, an etiam Sol vel T[illegible]
et ejus eccentricitas bisectione statuti equidem [illegible]
dam, postquam sincerioris astronomiae testimonio [illegible]
omnino in theoria Solis vel Terrae aequantem inesse [illegible]
monstrato, decet causam aequantis Ptolemaici a me [illegible]
Cosmographico pro justa et legitima haberi, cum [illegible]
nia omnibus planetis. Illam igitur hac operis parte [illegible]
quia declaratio erit generalis, utar voce planeta [illegible]
et sequentibus aliquot capitibus semper in specie [illegible]
Solem Tychonis intelligat.

Primum sciat, in omni hypothesi [illegible]
quantacunque eccentricitas fuerit, celeritatem [illegible]
apsidis proportionari quam proxime lineis [illegible]
planetam.

Fig. 25.



[illegible]

[illegible] dico, $\nu\chi$ sic delineatum arcum temporis, ut voluit Ptolemaeus, [illegible] ad $\delta\psi$ arcum itineris, (ut est $\alpha\delta$ distantia arcus $\delta\psi$ a [illegible] ad $\delta\beta$ distantiam mediocrem punctorum π, ϱ ab α, et simi- [illegible] $\varphi\varepsilon$ esse ad arcum itineris $\varepsilon\omega$ quam proxime, ut est $\alpha\varepsilon$ [illegible] a centro mundi α ad $\alpha\beta$ distantiam a centro mundi [illegible] potest contingere in π, ϱ signis. Est enim ut prius, ut [illegible] ad $\delta\psi$; et ut $\gamma\varphi$ ad $\gamma\varepsilon$ sic $\varphi\tau$ ad $\varepsilon\omega$; sed [illegible] est ad [illegible] (vel $\gamma\nu$) ad $\alpha\beta$; patet inde quia $\beta\delta$ est medium arithmeti- [illegible] $\alpha\delta$. Ptolemaeus enim facit $\alpha\beta$, $\beta\gamma$ aequales. Medium [illegible] inter terminos, inter quos parva est proportio, insensi- [illegible] est medio geometrico. Verbi gratia inter 10 et 12 me- [illegible] est 11: medium geometricum est $10^{19}/_{20}$ fere; ubi minus [illegible] particulae inter utrumque medium interest. Et tamen [illegible] familiares theoriae Martis, qui habet eccentricitatem omnium [illegible] Ptolemaeum.

[illegible] proportio $\gamma\nu$ ad $\gamma\delta$ sit insensibili major proportione $\alpha\delta$ [illegible] proportio $\chi\nu$ ad $\psi\delta$ insensibili major quam proportio $\alpha\delta$ ad [illegible] $\gamma\varepsilon$ ad $\gamma\varphi$ sic $\varepsilon\varphi$ ad $\varphi\tau$. Sed $\gamma\varepsilon$ ad $\gamma\varphi$ est fere ut [illegible] proportio illa insensibili aliquo minor est ista. Ergo [illegible] ad $\varphi\tau$ insensibili aliquo minor est proportione $\varepsilon\beta$ ad $\alpha\varepsilon$. [illegible] Est enim proportio $\alpha\delta$ ad $\delta\beta$ insensibili minor pro- [illegible] $\beta\varepsilon$ ad $\varepsilon\alpha$, eo quod $\beta\delta$ vel $\beta\varepsilon$ est medium arithmeticum [illegible] Probatum autem fuit, proportionem $\nu\chi$ ad $\delta\psi$ [illegible] $\alpha\delta$ ad $\delta\beta$, ex duabus minori; et proportionem [illegible] esse proportione $\varepsilon\beta$ ad $\alpha\varepsilon$ ex duabus majori; ut quanto [illegible] $\delta\beta$, et $\varepsilon\beta$ ad $\alpha\varepsilon$, illa minor et haec major, tanto ex [illegible] ad $\alpha\varepsilon$, illa major, haec minor. Itaque etiam illius [illegible] aliqua compensatio, ut multo propius vero sit, [illegible] ad unguem esse aequalem proportioni $\varepsilon\omega$ ad $\alpha\varepsilon$. [illegible] arcubus $\delta\psi$ et $\varepsilon\omega$, qui hactenus fuerunt inaequales, [illegible]

[illegible]

[illegible] In

Caput XXXIII.

Virtutem, quae planetas movet, residere in [illegible]

Cum ergo demonstratum sit capite superiori, [illegible] bus partibus circuli eccentrici (sive in aequalibus [illegible] esse in proportione ea, in qua sunt ad invicem [illegible] cessus a puncto, unde computatur eccentricitas, seu [illegible] abest planeta a puncto illo, quod pro centro mundi [illegible] illum incitari circa illud punctum: necessarium est [illegible] debilitationis insit aut in ipso planetae corpore [illegible] in ipso suscepto mundi centro.

Est siquidem usitatissimum axioma per universam [illegible] rarum eorum, quae simul et eodem modo [illegible] que dimensiones accipiunt, alterum alterius [illegible] que ejusdem causae effectum esse; ut hic [illegible] cum accessu et recessu a centro mundi in proportione [illegible] Quare vel debilitatio ista erit causa discessionis sideris [illegible] discessio debilitationis, vel utriusque erit aliqua causa [illegible] opinari quisquam potest, tertium aliquid concurrere, [illegible] causa sit; et in sequentibus capitibus [illegible] tale quippiam confingere; cum sufficiant duo ista [illegible]

Porro neque est naturae consentaneum, [illegible] motu longitudinis esse causam distantiae a centro, [illegible] prior est cogitatione et natura quam motus [illegible]

[illegible]

[illegible] ab hypomochlio, hoc reddi ponderosius; non se ipso [illegible] brachii sustentantis in hac distantia. Utrinque [illegible] seu vecte et illic in motu planetarum, haec debilitas [illegible] distantiarum.

[illegible] autem corpus in centro sit, nullumne, ut apud Copernicum, [illegible] et apud Tychonem ex parte; an Terra, ut apud Ptole[illegible] ex parte; an denique Sol ipse, quod mihi, quod et [illegible] speculatur, placet: id parte prima rationibus physicis coepi [illegible] enim in principiorum numero posui, quod jam cap. XXXII. [illegible] geometrice demonstratum est: planetam moveri debiliter, cum [illegible] unde ejus computatur eccentricitas.

[illegible] principio argumentatus sum probabiliter, Solem potius in illo [illegible] mundi esse, vel Ptolemaeo Terram, quam aliud aliquod [illegible] vacuum. Liceat ergo etiam hoc capite, demonstrato jam [illegible] idem argumentum probabile repetere. Deinde memineris, [illegible] parte secunda, phaenomena sub noctium extrema pulchre [illegible] Martis cum apparenti Solis in consilium adhibeamus: [illegible] eccentricitatem et distantias ex ipso corporis Solaris centro [illegible] rursum Sol ipse in centrum mundi (Copernico) vel saltem [illegible] planetarii (Tychoni) veniat. Sed horum duorum [illegible] nititur probabilitate physica, alterum procedit a posse [illegible] in caput LII. distuli, ob captus difficultatem, demon[illegible] quod fieri aliter non possit, quin planetam Martem ad [illegible] referamus, et diametrum apsidum, quae bisecat eccen[illegible] velimus, quae nullo pacto a parallaxibus [illegible] de re, si quis moram fert impatientius, caput LII. [illegible] legenda [illegible]. Nihil enim ibi assumitur nisi [illegible]. Similem demonstrationem invenies parte quinta, ex [illegible]

[illegible] centrum systematis competente, fons virtutis motricis [illegible] Solem competat, cum ut ipse in centro mundi jam [illegible]

[illegible]

prout propior vel remotior à Terra fuerit, et sic [illegible]
sequeretur. Sin autem Terra movetur, a Sole et ipsa [illegible]
id celerius vel tardius, prout ei propior aut ab eo [illegible]
in corpore Solis virtute perpetuo constante. Itaque inter [illegible]
medium nullum est.

Ego in Copernico acquiesco, et Tellurem unam ex [illegible]
Ac etsi de Luna idem potest objici Copernico, quod [illegible]
ego objeci Tychoni, quod scilicet absurdum videatur, [illegible]
moveri, praetereaque illi concatenari et copulari, sic ut [illegible]
circa Solem a Sole rapiatur: malo tamen unam Lunam [illegible]
dispositione corporis (ut in Opticis demonstravi) movente [illegible]
tati in Terra sedenti, extensae verò versus Solem, ut [illegible]
capite XXXVII, quam eidem Terrae etiam Solis ejusque [illegible]
planetarum motus transscribere.

Sed pergamus in contemplatione hujus in Sole [illegible]
tutis, et jam porro videamus arctissimam ejus [illegible]
quia figurarum regularium similium [illegible] et circulorum [illegible]
ad invicem, uti earum semidiametri; ergo ut $\alpha\delta$ ad [illegible]
circuli per δ ex α descriptus ad ambitum circuli per [illegible]
Ut autem $\alpha\delta$ ad $\alpha\gamma$, sic fortitudo virtutis in γ ad [illegible]
δ conversim per demonstrata capitis XXXII. Ergo [illegible]
culum δ angustiorem, ita virtus γ ad virtutem δ [illegible]
sparsior virtus, tanto imbecillior, et contra quanto [illegible]
Hinc intelligimus, tantundem virtutis esse in universo [illegible]
quantum in ambitu angustioris circuli per δ, [illegible]
parte capite primo plane in eundem modum et [illegible]
Ergo utrique [illegible] omnibus [illegible]

[illegible] Solis [illegible] virtus [illegible]
tamen alii, utrum sese habeat lux instar [illegible]
[illegible]

[illegible]

[illegible] veluti superficies quaedam, plane ut lux: ut hoc univer-[illegible] rerum immateriate descendentium descensu ipso non extendi [illegible] quamvis a corpore (ut haec a corpore Solis) orian-[illegible] lege ipsa defluxus, se ipso non terminati, sed tamen ut [illegible] illustrandarum efficiunt, ut lux consideretur quasi quaedam [illegible] recipiunt et terminant ejus defluxum: ita corpora rerum [illegible] videntur, ut virtus haec motrix consideretur quasi quod-[illegible] geometricum, quia corpulentia tota sua terminant seu recipiunt [illegible] motricis defluxum: ut illa nuspiam in toto mundo esse aut [illegible] nisi in ipsis corporibus mobilium: nec sit, sed quasi fuerit [illegible] inter fontem et mobile, plane ut lux.

[illegible] simul objectioni alicui responderi potest. Dictum enim est [illegible] virtutem hanc motricem extensam esse spatiis mundi, et [illegible] alicubi collectiorem, quas affectiones simul intensio et [illegible] sequatur. Jam vero dictum, virtutem hanc esse [illegible] sui fontis, nec recipi uspiam nisi in subjecto mobili, [illegible]. Videntur autem pugnantia, materia carere et tamen [illegible] subjacere, diffundi per mundi amplitudinem et [illegible] ubi est mobile. Respondetur autem sic: quamvis [illegible] materiale quippiam, quia tamen materiae, hoc est [illegible], destinatur, non liberam esse a legibus geometricis, [illegible] actionem transvectionis. Nec opus est multis. [illegible] perfici in loco et tempore, et emanare atque [illegible] a fonte per spatia mundi, quae sunt omnia res geo-[illegible] caeteris geometricis necessitatibus obnoxia sit [illegible]

[illegible] philosophari videar, proponam lectori [illegible] cum in Solis corpore est ipsa [illegible]

[illegible]

lucis illustratione confundit et tertium quippiam effici...
in mora non est, quin planetae tanta celeritas existat...
at non ideo tanta est planetae celeritas, repugnante...
aurae aethereae materia qualicunque, vel dispositione...
tem (alii dicerent, pondere, me non simpliciter pl...
Terra agitur); quarum rerum contemperatione cum...
tiis temporibus efficitur periodicum planetae tempus.

Caput XXXIV.

Corpus Solis esse magneticum, et in suo ...

De illa itaque virtute diximus, quae corpora planet...
et trahit, quomodo comparata, quomodo luci cognata...
esse metaphysico. Sequitur, ut indice hac definite...
imaginale ipsum etiam penitiorem fontis naturam co...
quo possit, in corpore Solis latitare divinum...
animae nostrae, ex qua effluat species ista, planet...
anima jaculantis lapillos species motus in lapillis...
hantur illi, etiam cum qui jaculatus est, manum...
sobrie progredientibus paulo aliae cogitationes...
virtus illa ex Sole ad planetas exporrecta in...
corpus intransportabile fieri id aut cogitatione...
potest, quam hoc, ut virtus eandem viam est...
abripit: quod et in ballistis et omnibus...
est. Quo pacto...

[illegible] qui vero post illum stant, oculorum ejus aspectu tunc [illegible] convertens circumfert oculos ad universos in orbem, [illegible] brevissimi temporis ejus oculorum aspectu potiuntur, [illegible] per accessum luculae seu speciei coloris ab oculis [illegible] in [illegible] delapsae. Ergo circumferens oculos in angusto illo [illegible] ejus collocatum est, una circumfert luculae illius radios [illegible] orbe, in quem spectatorum oculi circumcirca dispositi [illegible] circumiret lucula illa, spectatores ejus oculorum aspectus [illegible] participes. Hic vides manifeste, speciem immateriatam lucis vel [illegible] cum circumlata vel stante re sua, cujus est species; [illegible] species fontis, seu virtus planetas movens, gyretur circa [illegible] ipsam quoque, cujus est species, Solem nempe gyrari, [illegible] exemplo non absurde concludo.

[illegible] argumento idem evincitur, quod motus localis et tem[illegible] competere in speciem immateriatam nudam, ut quae [illegible] recipere nequit, nisi simul, ut virtus haec materia [illegible] quoque receptus tempore careat. Cum ergo virtus [illegible] sit, neque tamen infinitas possit concedi celeri[illegible] (quae celeritatem etiam corporibus inditura videtur) et [illegible]; se ipsa igitur hunc motum nequit perficere, [illegible] illum necesse est, quia corpus ejus a quo dependet [illegible] etiam argumento recte concludi videtur, non esse [illegible] intra corporis Solaris terminos, cujus conversione [illegible] ab illo immateriata descendens. Rursum enim [illegible] localis motus cum tempore non recte tribuitur. Relin[illegible] ipsum Solis modo supra dicto gyretur, et polis suis [illegible] corporis per illos inter [illegible]) monstret [illegible] corporis sui maxime [illegible] [illegible] naturalis [illegible]

[illegible]

humillimo, inesse vim materialem sese [illegible]
Solaris. Unde evincitur, Solaris corporis [illegible]
omnium planetarum periodica tempora [illegible]
trimestri spatio Solem semel in suo spatio [illegible]

At cum in meo Mysterio Cosmographico [illegible]
proportionem esse inter semidiametros corporis Solis [illegible]
est inter semidiametros corporis Terrae et orbis Lunae [illegible]
concluseris, sic esse periodum orbis Mercurii ad [illegible]
ut est periodus orbis Lunae ad periodum corporis Terrae [illegible]
diameter orbis Lunae sit sexagecuplus semidiametri corporis [illegible]
vero orbis Lunae (seu mensis) trigecuplus paulo minus [illegible]
(seu diei) et sic proportio amplitudinum dupla ad [illegible]
periodicorum: si igitur etiam in Sole et Mercurio [illegible]
Solis corporis diameter sit sexagesima circiter [illegible]
tempus conversionis globi Solaris tricesima de [illegible]
versus orbis Mercurii: adeo ut verisimile sit Solem [illegible]

Sin autem mavis diurnum Soli tempus [illegible]
conversionis vi quadam magnetica dispensatur [illegible]
sione, haud equidem repugnaverim. Sane [illegible]
in quo primus actus omnis motus inest, non [illegible]

Confirmatur autem haec opinio (de conversione [illegible]
ille sit causa motus planetis ceteris) hoc [illegible]
pulcherrime. Nam quia Lunae motus [illegible]
quationem cap. XXXII. XXXIII. [illegible]
forte est (nam quod est hic Sol planetis [illegible]
illa demonstratione). Considera igitur [illegible]
inferat, duo nempe. Tellus haec [illegible]
vicies seque aqua contrarium [illegible]
tantum potest in Lunam, ut [illegible]
quidem eandem in quam Tellus [illegible]

[illegible]

[illegible] movens tanto videtur fortior, quod verisimile, sit corpus ejus [illegible] densissimum [illegible] virtus attractiva [illegible] orbiculariter spargitur, ita ut [illegible] intra quem constitutum ferrum [illegible] complexum illius orbis veniat, ad eandem plagam [illegible] movens ex Sole propagatur in orbem, [illegible] orbis est imbecillior. Ut vero magnes non [illegible] (ut ita dicam) seu fibras (motoriae virtutis sedem) [illegible] ita ut ferri lingulam, si medio loco inter [illegible] consistat, non attrahat, sed tantummodo parallelon [illegible] credibile est, in Sole non esse ullam vim planetarum [illegible] magnete (accederent enim ad Solem tantisper, donec cum [illegible] penitus), sed tantum directoriam, ideoque fibras habere [illegible] circumporrectas, quae monstratur a circulo zodiaco. [illegible] perenniter, convertitur et in orbem vis motrix seu [illegible] fibris Solis magneticis, per omnia planetarum [illegible] convertitur eodem tempore cum Sole; non secus atque [illegible] magnetis ipsa quoque virtus magnetica transfertur [illegible] magneticam insequens.

[illegible] attigi exemplum magnetis et omnino rei convenientis, [illegible] ipsa dici possit. Nam quid ego de magnete, tan- [illegible] ipsa Tellus, Gulielmo Gilberto Anglo [illegible] magnes, eademque (eodem auctore, Copernici) [illegible] singulos, uti ego Solem volvi conjicio: et [illegible] habet magneticas, lineas motionis [illegible] fibras [illegible] motioni parallelis [illegible] ut [illegible] optime, Lunam ab hac Terrae [illegible] magneticae translatione [illegible]

[illegible]

Et primum quod attinet, consideratione dign[illegible] alterum alteri lumen Solis intercipit, sic etiam [illegible] impediant, ubi easdem cum Sole lineas inciderint: [illegible] [illegible] vel instrumentum virtutis motricis. Videri [illegible] [illegible] fieri posset, caveretur, inclinationes [illegible] deviationesque ab ecliptica et transpositiones nodorum [illegible] tiones corporum umbrarumque in conum attenuationes [illegible] cunque non plane evitari potuerit, quin sidera [illegible] Sole lineas inciderent, proclive est suspicari, inde [illegible] apogaeorum et nodorum (qui sunt quasi quaedam [illegible] [illegible] restitutoriis) originem suam traxisse. [illegible]

Sed respondetur, primo non turbandam esse [illegible] virtutem motricem, temere confusis proprietatibus [illegible] corpore non impeditur, propter hoc ipsum, quia [illegible] sed in superficiem vel quasi. Virtus in corpus [illegible] opaco igitur correlatum cum non sit, neque [illegible] nempe lucem a virtute movente pene separarem [illegible] exempla, quae lucis radiis etiam impeditis [illegible] quorsum pervenire prohibentur. Sed de lucis [illegible] non praecipue hic satago.

Accipiamus autem ad suspicionem hanc [illegible] exemplum alterum magnetis. Ejus virtus [illegible] (sane quia immateriata est) sed [illegible] vitreas, aqueas, ligneas [illegible] si [illegible] laminae [illegible] sed [illegible] igitur [illegible] [illegible] interjectis [illegible] bibit virtutem magnetis illico, eaque [illegible] [illegible]

[illegible]

Caput XXXVI.

[illegible] ex Sole motrix per mundi amplitudinem [illegible].

[illegible] objectio paulo difficilior, orta ex eo, quod supra cap. XXXIII. [illegible] oppositum cognationi lucis et virtutis motricis, sed quae [illegible] immaterialitas contemplatione pugnare videtur [illegible], [illegible] vit improvidum.

[illegible] cap. XXXII, planetarum motus intensionem et remis- [illegible] proportionem distantiarum simplicem. At videtur virtus ex [illegible] et remitti debere in proportione duplicata vel tripli- [illegible] linearum effluxus. Ergo intensio et remissio motus [illegible] ex attenuatione virtutis ex Sole emanantis. Probari [illegible] modum, tam de luce quam de virtute movente; [illegible] sunt clariores. Lector virtutem motricem subintelligat. [illegible] aliquod α (Fig. 86) de corpore Solis: id ergo sparget [illegible] et per demonstrata in Opticis ut sese habet ampli- [illegible] γ amplioris, radios hosce per imaginationem [illegible] [illegible], sic se habebit densitas lucis in orbe β angu- [illegible] ejusdem in γ ampliore.

[illegible] aliquis maximus δε in corpore Solis lucidus. Fig. 86. [illegible] quorum sunt infinita, spargent hac ipsa [illegible] singula hemisphaeria β et γ. Ac ut se habet [illegible] lineae circularis (quae eminus apparet recta) [illegible] [illegible] αβ, convenienter habet se apparentia diametri [illegible] [illegible] δβε angulum [illegible] [illegible] angulum. Cum ergo longior appareat [illegible] [illegible] β [illegible] γ [illegible]

[illegible]

sit superficies hemisphaerica; nam aeque multip [illegible]
proportio. Sphaerica vero superficies ab [illegible]
rupla esse ad planum circuli maximi in sphaera [illegible]
corpus duplo distans longius in γ quam in β, [illegible]
[illegible] in γ quam in β, non tantum [illegible]
ipse videtur intendi debere claritas radiorum [illegible]
[illegible] videntur amplificari, ut Venus in [illegible]
corporibus umbram circumscribit quam in [illegible]
[illegible] a nobis institutae inter [illegible]
vi motrice concipi debere.

Ad hanc objectionem solide respondeo, [illegible]
assumi. Nam etsi sic ego in Opticis quoq [illegible]
me locutum meminero, quorum puncta et lineae [illegible]
Etenim quod punctum attinet, cum id nullam [illegible]
[illegible] vero radiationes, cum [illegible]
nem per se nullam esse, quare nulla [illegible]
minor densitas. Itaque usurpatio prima [illegible]
hoc pacto intercidit. Quin potius ob id [illegible]
fortius vel imbecillius lucere, quia illud [illegible]
quantitatem designat. [illegible]

In secunda circuli et tertia [illegible]
quod circulus mathematicus, cum [illegible]
non luceat se ipse, quum non potest [illegible]
gigni intelligitur. Sane nihilo magis [illegible]
linea trium [illegible]

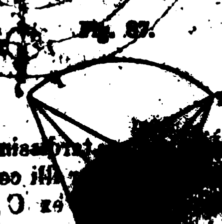
[illegible]

[illegible] in ratiocinatione. Nam sicut in luce non effluunt radii [illegible] circulis corporis ad respondentia sphaerae puncta et cir- [illegible] a sole α (quo pacto nulla posset adscribi luci densitas [illegible] in ipsa origine nullam haberet quantitatem, utpote a [illegible] sed effluunt a toto lucentis hemisphaerio radii ad sin- [illegible] superficiei puncta, ut in γ effluit radius tam ex [illegible] in negotio virtutis idem hoc locum habet. Nam [illegible] corporis Solaris magnetica ordinantur secundum longitudinem [illegible] tantummodo circulus maximus corporis Solis subest [illegible] et quam proxime orbitae planetae; denique etsi [illegible] (tandem sub polis in puncti angustiam attenuati) [illegible] respondentibus suis circulis in sphaera planetae: tamen ab [illegible] corporis filamentis (ab uno hemisphaerio corporis stantibus) [illegible] tam ad puncta singula itineris alicujus planetae, [illegible] polis corporis Solis imminentes, et planetae corpus [illegible] densitatis hujus integrae speciei, ex filamentis omnibus [illegible]

[illegible], ut sicut Sol quaquaversum lucet aequaliter, sic [illegible] moveere possis, quaquaversum moveatur sine discrimine. [illegible] Solis magnetica movent solitarie considerata, sed [illegible] conversum in suo spatio ipsa quoque filamenta, et [illegible] ab iis dimanantem circumfert. Non igitur ibit [illegible] quia Sol perpetuo volvitur in directum. Non ibit [illegible] in iis punctis etiam aliqua de corpore Solis species [illegible] filamenta corporis Solaris versus polos extenduntur, neque [illegible], sed in eam, quorsum ipsum filamenta sua [illegible]

[illegible] sicut ut planetae versus polos rapiantur, ut [illegible] medio inter polos, per quam omnes planetas, [illegible] (de quibus infra cap. XXXVIII.) sine [illegible] sit necesse. Nam quae species hemi- [illegible] puncto zodiaci, quia in praesenti schemate [illegible] eodem

[illegible] in γ est. Ubi Fig. 87.



[illegible]

Caput XXXVII.

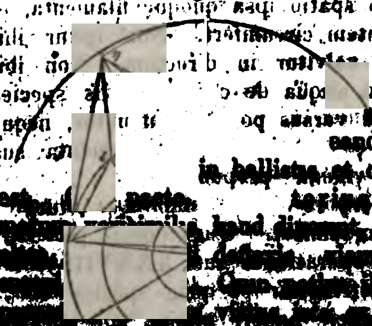
Virtus Lunam movens qu[...]

Et quia cap. XXXIV. obiter in motus L[...] totum negotium delineare paulo clarius, ne [...] lectorem in toto hoc tractatu torqueat, quo [...] bent assensum: quin potius ut mirifice [...] Lunaris contemplatione: denique ut astronomiae [...] integra. Nam etsi in theoriam Lunae paucula [...] seu aliter tradenda seu particularius explicanda [...]

Animadvertit Tycho Braheus per[...]tiones Lunae in omni situ cum Sole, quod [...] cycli et praeter illam anomaliam menstruam [...] fuit, ipse etiam medius motus (respectu horum [...] diurnus) nondum sit plane medius, sed [...]sitiones cum Sole, remittatur in quadraturis; ut [...] epicyclis, tamen Luna ipsa etiam in [...] qualiter circuimiret.

Sit [...]

Fig. 58.



[illegible]

[illegible] tendet, [illegible] igitur tarde movebitur ex C in L. Nempe non [illegible] Lunam Soli permittamus a Terra liberam. Aberrarent enim [illegible] ut apogaea a locis suis aberrant. Quia potius tribuenda [illegible] Lunae, ceu catena quaedam, quae [illegible], etsi Luna [illegible]; et qua posita Luna cum Terra quasi in eadem [illegible] in eadem virtute Solis, jamque, quasi hoc motu ex Sole [illegible] a Terra rotatur. Itaque celeritatis in O, C causam [illegible], quam eam, quod T Terra virtutem movendi Lunam [illegible], eamque continuatione lineae TS conservat. Itaque SO/TO [illegible] virtuosa appellari potest, cum hi duo fontes sint omnis [illegible] S.

[illegible] sequetur etiam illa inaequalitas menstrua Ptolemaeo [illegible] in C, O fortior est quam in F, L, lapsa ex eodem [illegible] si apogaeum in C, O versatur, majus damnum celeritatis est, [illegible] in F, L. Majores ergo aequationes ex apogaeo O [illegible] F, L, quam ex apogaeo F vel L in C, O, conjunc[illegible]

[illegible] speculationes hasce physicas ita comparatas esse, ut [illegible] sufficere possint; neque incitari Lunam a Sole [illegible] circumveniat, sed a virtute aliqua in Terra ipsa deli[illegible] speciem sui immateriatam ad Lunae corpus ejaculante, [illegible], quae centra Solis (primarii fontis) et Terrae con[illegible] diameter ista virtuosior evadat, difficile est explicare [illegible] Solis neque Terrae virtus emanans in Lunam tunc [illegible] in hanc diametrum incidit. Aequabiles enim et [illegible] horum corporum (quare et specierum) conversiones, [illegible] Relinquitur ergo [illegible] quod dictum est, ut non [illegible] robustior sit virtus ex Terra delapsa in parti[illegible] originaliter per ipsam illam lineam [illegible] immediate [illegible] per id, quod Telluris motum [illegible] directecum ejus motus, quem [illegible] Lunae [illegible] quod circuitus Lunae [illegible] efficitur, [illegible]

[illegible]

[illegible]e, ut planeta, si in eadem a Sole [illegible] circumferretur, nullam sensuris inaequalitatem [illegible] Solaris. Quod autem inaequalitas aliqua in [illegible] henda, id accidit ex eo, quod planeta ex alia a Sole [illegible] transpositus; quo pacto in alium atque alium [illegible] Sole virtutis incidit. Quaeritur ergo, si orbes [illegible] Braheus, unde eveniat, ut planeta a Sole [illegible] num etiam hoc ex Sole? Est, inquam, quoniam [illegible] non [illegible] Sole.

Clamant rerum naturalium exempla et [illegible] cum his terrestribus cognatio, simplicis corporis [illegible] rationes, hoc esse simpliciores. Varietates [illegible] motu planetarum diversa a Sole distantia seu [illegible] causis existere concurrentibus.

Sic in flumine simplex aquae proprietas [illegible] dere. Quia vero iter ejus directum non [illegible] invenit alveum; stagnat, ubi in soli aequabilitate[illegible] strepitu, qua libramentis incitatur [illegible] si perniciosi lapsu in procurrentes scopulos [illegible] insita nihil nisi descensum molitur ad Terrae [illegible] simplex opus; declinatio vero et stagnatio [illegible] varietas a causis assignatis seu extrinsecis [illegible] jucunda et nostro negotio accommodatior [illegible] gierum impulsione. Si funis seu rudens [illegible] pendeat ex utraque ripa [illegible] fune cymbam in flumine [illegible] [illegible]

[illegible] cymbas in gyros agunt, huc illuc [illegible]

[illegible]

Caput XXXIX.

[illegible] movere debeant virtutes planetis insitae, [illegible] qualem vulgo credunt, per auram aetheream efficiatur.

[illegible] in demonstratis verissima ista axiomata: Primum, [illegible] natura inclinatum sit ad quietem in omni loco, in quo [illegible]. Secundo, quod ea virtute, quae ex Sole, de loco in [illegible] zodiaci transponatur. Tertio, si non muta[illegible] a Sole, futurum ex hac transpositione iter circulare. [illegible] planetae in duabus per vices distantiis a Sole toto am[illegible] tempora periodica futura in dupla proportione distantiarum [illegible]dinis. Quinto, virtutem nudam et solitariam in [illegible] residentem non esse sufficientem transportando de loco [illegible] corpori, quod pedibus, alis et pinnis caret, quibus in aura [illegible]. Sexto, et tamen accessus planetae ad Solem et ab eo [illegible], quae est propria planetae. Haec omnia et naturae [illegible] et demonstrata hactenus.

[illegible] geometricis exerceamur, ut appareat, ad quamlibet [illegible]sentandam quibus legibus opus sit. Esto ut planetae [illegible] hactenus creditum, isque a Sole fonte virtutis eccen[illegible]tricus. Sit ille eccentricus CD, centro B diastemate BC descrip[illegible]tus, in eo BC linea apsidum, et A Sol et BA eccentricitas. Divi[illegible]datur eccentricus in partes quot[illegible]cunque aequales, initio a linea apsidum facto in C, quarum ter[illegible]mini connectantur cum A. Erunt [illegible] CA, DA, EA, FA, GA, HA [illegible] aequa[illegible] [illegible] centro [illegible] diastemate [illegible] [illegible] aequalis [illegible] AB [illegible]

Fig. 90.



[illegible]

tiam $\alpha\vartheta$ necessario et sine speciali consilio [illegible] ipsi A D.

At praeterquam quod is cum axiomate [illegible] dicit, planetam vi insita progredi de loco in locum [illegible] alia absurda involvuntur. Ducatur enim ipsi B D [illegible] aequalis ipsi B D, et centro N scribatur epicyclus, [illegible] igitur, existente ϑ D perfecto circulo, [illegible] D, apud B centrum eccentrici et ab N centro epicycli [illegible] (per aequipollentiam demonstratam capite II.) [illegible] planetam in D habet, manente ipsi A B [illegible] ideo hic poneretur eadem celeritas N centri epicycli [illegible] netae circa B centrum epicycli, ita ut [illegible] simul remitterentur; et quia intensio et [illegible] distantia corporis planetae a Sole, ideo centrum [illegible] distantia, fingeretur tarde vel celeriter moveri [illegible] longius vel brevius a Sole. [illegible]

Et quamvis virtus planetas vehens celerius [illegible] tis, ut ostensum cap. XXXIV, hic tamen [illegible] natione unus virtutis ex Sole radius A N [illegible] epicycli perpetuo maneret; quae linea [illegible] tarde, interdum velox; [illegible] eadem distantia eandem perpetuo [illegible] [illegible] sese evolventem ex hoc imaginario [illegible] temporibus aequalibus inaequaliter, prout [illegible] vel tardius fieret. [illegible]

[illegible]

[illegible] et bruta ex Sole virtus esset effectura. Quae omnia [illegible] cum, Aristotele teste, infiniti nulla sit scientia; [illegible] huic intensioni et remissioni. [illegible], quod ipsae etiam observationes perfectum circulum CD [illegible] non sunt passurae: nec imbecilles istae (ut putantur) [illegible] consistunt, tantoque minus calumniis sunt obnoxiae. [illegible] consentaneum, planetas ipsi nihil esse curae neque [illegible], sed opus, quod ipse perficit aut ad quod effi- [illegible], esse iter libratorium in diametro $\gamma\zeta$ ad α Solem tendens. [illegible] mensura, qua [illegible] quolibet tempore [illegible] Nobis quidem [illegible] geometria et [illegible] Quoties enim planeta [illegible] est in [illegible] inquirimus [illegible] aequalem [illegible] vel ei [illegible] justam [illegible] distantiam [illegible] propositam [illegible] jam exspi- [illegible] ex epicycli amplitudine intra diametri $\gamma\zeta$ angustias [illegible] inquisitione facilius dicitur quid non sit, quam quid [illegible] momentis iis, quibus a Sole fuit collocatus in lineas [illegible] ductas, ipse ponatur effecisse distantias ordine [illegible] Quodsi igitur vis planetae est perfectae [illegible] partibus eccentrici CD, DE, EF respondent hae [illegible] in diametro, nempe $\gamma\eta$, $\eta\lambda$, $\lambda\zeta$ et quidem varietate [illegible] minimi, [illegible] maximi, sed ut medii sine [illegible] paulo minores illis $\lambda\zeta$ [illegible] et $\eta\zeta$, et $\gamma\eta$ minor quam $\eta\lambda$, $\lambda\zeta$ vero major [illegible] a Sole [illegible] proportionem [illegible] arcuum CD, DE, EF, vel angulorum [illegible]

Fig. 89.

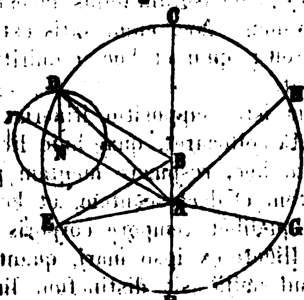


Fig. 90.



[illegible] ex Sole; quia hic necessario ponitur [illegible]
ginaria motus epicycli imaginarii, quae motus veri [illegible]
credibiliora quam priora, ubi motus corporis [illegible]
cognitione conjunctus fuit. Itaque, quae ibi disp[illegible]
gantur repetita; pene [illegible] coincidunt sententiae, [illegible]

Et tamen in penuria melioris sententiae [illegible]
cendum in hac. Quae quo plura absurda [illegible]
cap. LII. physicus aliquis admittet, quod [illegible]
planetae non esse circulum. [illegible]

II. Dictum est hactenus de mensura, quae [illegible]
respicit: restat ut et mensuram hujus mensurae [illegible]
per locum inquiramus. Nec enim satis est, [illegible]
tere debeat a Sole: quin et hoc requiritur, [illegible]
intervallo absistat.

Quem igitur ista suppositio itineris [illegible]
mentem in planeta collocaret, quae huic libration[illegible]
non poterit, quam hoc, respicere mentem [illegible]
tudinem crescentem et decrescentem, et hoc [illegible]
a Sole effecerit quolibet tempore corporis [illegible]
non possunt intelligere ex ipso mari, quantum [illegible]
eo quod iter illud nullis sit distinctum lim[illegible]
navigationis, si ventus et unda constantes [illegible]
[illegible], vel ex venti plaga et [illegible]
horum aut aliquorum saltem juncta consideratione [illegible]
[illegible]

[illegible] Solis oppositis secant, quod supra cap. XII. XIII. [illegible] observationibus est demonstratum. Ergo et diameter [illegible] Solem ipsum tendit, et latitudines Solem omnino respi- [illegible] de latitudine infra parte V. a mentis partibus ad [illegible] magneticas facultates sum traducturus. Nec mihi [illegible] esse hanc Solis diametrum ejusque variationem [illegible] possit. Certum enim est, in nullo planetarum [illegible]. Cum enim in Terra sit 30′, in Marte obtinebit 20, in Saturno 3, at in Venere 40, in Mercurio plane 80, et usque [illegible] parvitate hujus corporis, sed de sensuum humanorum [illegible], qui ad tam parva percipienda non sequuntur. [illegible] corpus aptum tamen est, quod in superiori- [illegible] movenda in circulum tam remota corpora. De illumi- [illegible] a tantillo corpusculo sciunt omnes. Credibile est itaque, si [illegible] sunt motores illi observandae hujus diametri; eam [illegible] quam sunt oculi nostri, quanto opus ejus et perennis [illegible] turbulentis et confusis negotiis est constantior.

[illegible] singulis planetis tribues oculos, Keplere? Nequaquam. [illegible] Neque enim ut moveri possint, pedes ipsis atque alae [illegible] vero solidos Braheus jam eliminavit. Neque exhau- [illegible] omnes naturae thesauros, ut per nostram scientiam [illegible] debeant. At etiam exempla nobis admirabilia sunt [illegible] physice, quibus oculis astrorum loca in zodiaco [illegible] corporum sublunarium, ut harmonica dispositione [illegible]) infer ea deprehensa subsultent et in opus [illegible] oculis suis signavit mater mea loca siderum [illegible] Saturni, Jovis, Martis, Veneris, Mercurii, [illegible] diebus liberos suos, praesentim [illegible] quam plurimi eorundem [illegible], aut quam plurima loca pristina quadra- [illegible]? Quae [illegible] in omnibus [illegible] ad hunc diem obtigerunt. Sed quid ago haec [illegible]

[illegible]

etiam repelleret: quod pugnat cum simplicitate [illegible] peculiari quadam ratione hanc translationem [illegible] Solis et planetas refert, is totam hujus capitis [illegible] eoque nomine deputatum est infra huic rei [illegible]

Vides lector considerate et ingeniose, quod [illegible] circulo eccentrico itineris planetarii multa incredibilia [illegible] physicis involvat; non quidem quod Solis diametrum [illegible] signo ponit: faciet enim id forsitan ipsa etiam [illegible] quod incredibilia transcribat et menti et animae [illegible]

At nos, qui vero propinqui sumus, jam [illegible] dum licet undique perfectas, idoneas tamen motibus [illegible] jicere discemus. Proderit tandem, ad exactiorem [illegible] reservatur in caput LVII, nos hic fuisse prius [illegible]

Caput XL.

Methodus imperfecta, aequationes ex physica [illegible] tamen sufficit theoriae Solis [illegible]

Tam prolixa disputatione opus fuit, ut [illegible] aequationum formam, [illegible] qua parte quanta [illegible] [illegible] ad aequationes eccentri Solis [illegible] partis tertiae materia, et cujus [illegible] capitis [illegible] praecedentia [illegible]

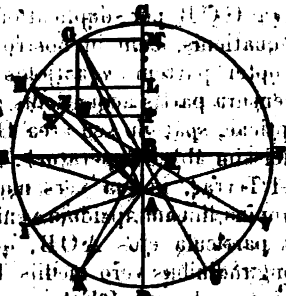
Primus meus [illegible]

[illegible]

[illegible] physica, cui fuit adjungenda optica capitis XXIX. methodo [illegible] inventa, ut haberetur tota. [illegible] ratio sit mechanica et taediosa, nec possit ex [illegible] solitarii, ceteris sepositis, aequatio computari, circum[illegible]. Cumque scirem, infinita esse puncta eccentrici, et [illegible] infinitas, subiit, in plano eccentrici has distantias omnes [illegible], sic olim et Archimedem, cum circumferentiae [illegible] diametrum quaereret, circulum in infinita triangula disse[illegible]. [illegible] occulta est ejus demonstrationis per impossibile ducen[illegible] [illegible], quod prius circumferentiam in 360 partes secabam, jam [illegible] eccentrici in totidem secui, lineis ex puncto, unde computa[illegible] [illegible].

[illegible] A Sol (vel Terra) [illegible] centrum eccentrici CD, cujus [illegible] dividatur in partes aequales [illegible], GH, HE, EL, IK, KD, et [illegible] puncta cum punctis divi[illegible] AC longissima distantia, [illegible] ordine AG, AH, [illegible] triangula aequalia [illegible] sive triangula CBG, [illegible] partibus circum[illegible] recta non diffe[illegible] habeant altitudinem [illegible] omnia igitur [illegible] CDE insunt haec triangula omnia, et in semi[illegible] [illegible] composi[illegible] [illegible] CED, sic area CBG ad aream CG, et permutatim, [illegible] CH et singulae ordine, sic tota CDE ad aream CBG [illegible] [illegible] CBG, CBH, areae [illegible]

Fig. 41.



[illegible]

eccentri, cujus aequatio optica est angulus BGA [illegible] trianguli scilicet BGA, est excessus (hoc loco) [illegible] anomaliam eccentri; et ejusdem trianguli angulus [illegible] maliae eccentri CBG supra coaequatam GAG. [illegible] cognitio utramque partem aequationis prodit, [illegible] coaequatae GAC.

Atque hinc etiam causa patet, cur supra capite [illegible] aequationis dixerim in theoria Solis quam proxime [illegible] quemlibet arcum eique superstantem angulum (ut [illegible] et CBG) metitur area sua, qui sector dicitur; ut la[illegible] pede circini in G et diastemate GB arcus circumfere[illegible] GA in O. Igitur ut area GBC ad angulum GBC, [illegible] angulum BGO. Sed angulus BGO est pars aequ[illegible] area GOB per duplicationem aequationis partis [illegible] aequationis, cum in nostro calculo prius explicato [illegible] propter partem aequationis physicam consulenda. [illegible] mensura partis aequationis physicae, excedit OGB, [illegible] opticae, spatiolo seu area OAB (et versus perihelium [illegible] vicissim ab eo superatur); in parva tamen [illegible] vel Terrae, in qua versamur hoc certe parva [illegible] propius lineam apsidum venitur, [illegible] et particula ejus AOB, quantumvis crescens [illegible] longitudinibus vero mediis BEA angulus [illegible] suratur ab area BEA, et excessus cum defectu [illegible]

Itaque summa differentia, quae contingere [illegible]

[illegible]

[illegible] perpendicularis ad CD, et triangulum BEA rectangulum [illegible] et BA basis. Ducta ergo 900 (ex dimidia basis [illegible] 1800) in altitudinem BE, scilicet 100000, qui est [illegible] area trianguli BEA (Eucl. I, 41) [illegible] 90000000. [illegible] cujus radius est 100000 (ex recentissima recognitione [illegible] solertissimi geometrae [illegible]) est 314159265[illegible], ne unius [illegible] errore. Et ut haec circuli area se habet [illegible] mediae seu temporis, hoc est ad 21600' vel 1296000": [illegible] aequationis area trianguli 90000000 se habet ad 3713", [illegible] Itaque area BEA valet 1° 1' 53". Sed et angulus [illegible] XXIX. XXX. fuit 1° 1' 53". Aequationis igitur utraque [illegible] hoc loco, circa gradum scilicet 90.

[illegible] anomaliae eccentri sic agendum. Cum BEA sit [illegible] altitudo ejus ad HL vel GM altitudines caeterorum, [illegible] HBC, GBC anomaliae eccentri: ita 3713" [illegible] triangulorum. Ita multiplicabitur 3713" in sinus [illegible] et abjectis quinque ultimis cyphris erunt residua [illegible] aequationis physicae, illi angulo ad B respondentia. [illegible] HBC 45° 45' 46", quantus supra cap. XXXI. fuit. [illegible] in 3713" ductus abjectis 5 ultimis constituit 2659", [illegible] partem aequationis supra in tabula [illegible] parte optime. Itaque hic areola ABC ubi maxima, [illegible]

[illegible] partes, illa ratio aequationes eccentri computandi, qua de [illegible] XXXII. coepi dicere; quae naturam ipsam rerum et [illegible] XXXIII. XXXIIII. proximius proxime exprimit.

[illegible] in argumentatione mea, non magni [illegible] quod Archimedes circulum secuit quidem in in- [illegible] circumferentiae [illegible]; ut quorum [illegible] in circum- [illegible] a rectis ex A [illegible] in C, D puncta [illegible]. Et possunt [illegible] HBC, GBH [illegible]

Porro eadem ratione demonstratur, etiam [illegible] tiae ab A, respondentes omnibus 360 gradibus [illegible] sunt in superiori capitis XXX tabula [illegible] minores quam 36000000. Trajiciatur enim [illegible] que, praeter BC, quae sit EV, et connectantur [illegible] triangulo EBV rectae EB, BV junctae [illegible] distantiae oppositae. Sed EB, BV omnes [illegible] ergo EA, AV omnes 360 collectae facient [illegible]

Ut igitur repetam, quae jam sunt dicta, haec [illegible] compendiosissima quidem est, et naturalibus [illegible] tatis innititur, sed et in theoria Solis [illegible] observatis, sed tamen in duobus peccat: primo, quod [illegible] perfectum circulum, quod verum non esse, [illegible] (Posita elliptica orbita planetae, nihil peccat haec [illegible]) secundo, quod plano utitur non exacte [illegible] a Sole; quartum tamen [illegible] altera [illegible] exactissime tollit, ut infra [illegible]

Et quia haec [illegible] [illegible] ut hic me juvent in plano [illegible] [illegible] distantiis. Geometrice [illegible] sed doceant me numerare [illegible] figuram inventam quadrare. E [illegible]

[illegible] in lineam [illegible] consideratione [illegible]

Fig. 52.

[illegible] puncta C, H, E, [illegible] instrumentum [illegible]

[illegible] spatium [illegible] Solis [illegible]

non potest, ergo [illegible]

[illegible] AQRBSLA et CD plane esset aequalis figurae CBBD. Nam [illegible] esset BB in linea EA; et quia BA suprema et infima sunt [illegible] aequalis ipsi LB, et BR ipsi SB &c.: ergo figurae BBRQA [illegible] congruae, quarum altera defectus, altera excessus est [illegible] et EBBD aequalium: tota igitur figura inter AQRBSLA [illegible] inter BB et CD aequalis est. Itaque spatiolum inter duas [illegible] AQRBSLA et AAAAAAA metitur excessum distantiarum ex A [illegible] ex B, in ea quidem mensura, in qua parallelogrammum [illegible] omnibus distantiis ex B.

[illegible] spatium hoc non est ejusdem latitudinis in locis a linea [illegible] remotis ad [illegible] latius. Nam [illegible] V, ut AH, AV respondeant angulis HBE superiori et [illegible] aequalibus et aequaliter a mediis punctis E, F remotis. Et [illegible] AV per AH et BH arcus circuli ducatur XY. Si [illegible] erit AYR plane congruum triangulo AVR: nam AV [illegible] aequales ex constructione, et longiores; sed et VR, [illegible] De puncto vero H extra circumferentiam [illegible] duae HX per centrum A et HY praeter centrum, ergo [illegible] major ergo AV vel AX augetur breviori XH, [illegible] RY augetur longiori YH: et tamen tota RH manet bre[illegible] AH. Ergo differentia RH et AH minor est differentia [illegible] differentia VR et VA. Itaque in conchoide SA major [illegible] BH aequales. Non ergo bisecatur ab EA spatium [illegible]

[illegible] XLIII, invenies aestimationem crassam hujus spatii [illegible] aequationis computatione generaliter prae[illegible]

[illegible] (quod tamen infra de Marte negabitur cap. XLV. et LIII.) [illegible] operatio a sua speculatione praemissa divideretur.

[illegible]

COMMENTARIORUM

DE MOTIBUS STELLAE

PARS QUARTA.

INVESTIGATIO VERAE

PRIMAE INAEQUALITATIS

EX CAUSIS PHYSICIS ET PROPRIIS

Caput XLI.

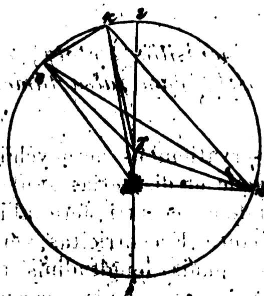
[illegible] *et proportionis orbium inquisitio tentata, ex* [illegible] *extra oppositionem cum Sole, cum falsa tamen conditione.*

[illegible] secunda imitatione veterum ex observationibus acronychiis [illegible] aphelium et eccentricitatem, unaque et distantias stellae [illegible] in toto circuitu. Et aequationes quidem eccentri fere aliis [illegible] extra situm acronychium respondebant. Eccentricitas vero [illegible] Sole repudiabantur a parallaxibus annuis longitudinis et [illegible] Itaque, ut distantiae stellae a centro Solis per omnem eccen[illegible] inquiri possent, prius secunda inaequalitas (epicyclica Ptole[illegible] anqui Tychoni et Copernico) parte tertia expedienda [illegible] si vis planetae perfectus esset circulus, vel jam statim [illegible] inaequalitas, quae est ratione eccentrici, indagari posset. [illegible] capite XXV. methodum tradidimus, ex tribus distantiis trium [illegible] punctorum ab aliquo puncto intra circumferentiam et angu[illegible] inquirere situm et magnitudinem circuli respectu illius [illegible] eccentricitatem cum apsidibus.

[illegible] XXVII. inventa est distantia Martis a centro Solis 147750 [illegible] apud nodum, idque anno 1595. d. 25. Oct. Capite [illegible] distantia Martis inventa est 163100 paulo minor [illegible] anno 1590. d. 31. Dec. Et quia Mars 41° abest [illegible] sinus 41° in sinum inclinationis maximae (cap. XIII. [illegible] inclinatio loci 1° 42′ 40″. Cujus secans radium superat in [illegible] par 22, quae sunt in dimensione nostra particulae 34. [illegible] loci esset 163434 paulo minor. Maneat 163100: [illegible] in secantem 41° ductus, producit [illegible] auferenda 20″ loco Martis, ut sit 5° 24′ 30″ [illegible]. [illegible] VIII. distantia Martis inventa est 166180 in 8° 19′ 20″ [illegible], [illegible] distans 68° a nodo; itaque inclinatio loci 1° 42′ 40″, [illegible] particulis 45, quae sunt in nostra dimensione 75. [illegible] 166255. Auferuntur 16″ loco Martis pro reduc[illegible]. Haec tria loca per praecessionem aequinoctiorum [illegible] reducta sic habent.

[illegible] 147750 [illegible]

Fig. 93.



Igitur in triangulo [illegible] *cruribus, invenitur angulus* [illegible] *Similiter in* $\kappa\alpha\vartheta$ *datum* [illegible] *ablatus* $\alpha\vartheta\eta$ *relinquit* [illegible] *centrum quaesiti circuli.* [illegible] *continuetur in* ε *aphelium* [illegible] *connectantur* η, [illegible] *ad circumferentiam* [illegible] *eodem arcu* $\eta\kappa$, *erit* [illegible] $\eta\vartheta\kappa$, *scilicet* 29° 28′ 8″; [illegible] *erit* $\kappa\eta$ 50868, [illegible]

Jam in triangulo [illegible] *cruribus, invenitur* $\kappa\eta\kappa$ 78° 44′ 1″, *et per hanc* [illegible] 163100. *Qualium ergo* $\kappa\eta$ *prius erat* 50868 [illegible] *fit* 107486. *Et quia* $\eta\gamma\kappa$ *est* 29° 28′ 8″, [illegible] *ad duos rectos, quia* $\eta\gamma$, $\kappa\gamma$ *aequales.* [illegible] *aufer* [illegible] $\kappa\eta\alpha$, *restat* $\gamma\eta\alpha$ [illegible] *gulus cum cruribus. Quare* [illegible] [illegible] 5° 24′ 21″ [illegible] *Per angulum vero* $\eta\alpha\gamma$ [illegible] 100900. [illegible] *Denique in* [illegible] [illegible] *partium* [illegible] [illegible] 100000 [illegible] [illegible]

[illegible] eccentrici, [illegible]

[illegible]

[illegible] observationes, Marte circa [illegible] proximas

[illegible] d. 17. Febr. hora 10. visus fuit planeta in 15° 12⅓′ ♌,
[illegible]
[illegible] 1586. 27. Dec. mane h. 4. in 29° 42⅓′ ♍, lat. 2° 46⅓′ b.
[illegible] 1587. d. 1. Jan. mane h. 7. 8′ in 1° 4′ 36″ ♎, lat. [illegible] b.
[illegible] in 2° 51½′ ♎, lat. 3° 6′ bor.
[illegible] 1588. d. 10. Nov. mane h. 6. 30′ inter ♂ et Cor ♌ 31° 27′.
[illegible] borea 3° 16¼′. Quare ♂ in 25° 31′ ♍, lat. 1° 46′ 43″ b.
[illegible] h. 6. inter ♂ et cor ♌ 45° 17′, declinatio austrina 2° 5′,
[illegible] ♎, lat. 1° 53⅓′ b. Non sunt autem hae obser-
[illegible] per fixas sequentes.
[illegible] 1590. d. 6. Oct. cujus diei mane h. 4. 45′ observatus est ♂
[illegible] a cauda Leonis et corde Hydrae, cum declinatione [illegible]:
[illegible] a Marte in longitudinem recta porrigeretur, accidit
[illegible] utrinque et per declinationem exstructae, 6′ discre-
[illegible] fieri potest, si minimum aliquid declinationi desit: cui
[illegible] non satis fisi, quod Martem a cauda ♌ mensi sunt, quae
[illegible] est, distantia puncti in latum abeunte, ut scilicet de
[illegible] certius scirent, quam ex declinatione [illegible]. Sed [illegible]
[illegible] 14′ et distantia a corde Hydrae 34° 33½′, fuerit ejus
[illegible] Itaque locus 17° 16⅔′ ♍, lat. 1° 16⅔′ b.
[illegible] exhibet in hac altitudine [illegible] Solis [illegible]
[illegible] Virgo ardua [illegible]
[illegible] in consequentia est projiciendus, unde [illegible] refrac-
[illegible] Parallaxis exigua admodum fuit, parum igitur detraxit
[illegible]
[illegible] Martii h. 8½ post merid. in 29° 12½′ ♋. Lat.
[illegible] Martii h. 8½ in 29° 18′ ♋, lat. 3° 19⅓ b.
[illegible] tempora Martem in eundem eccentrici locum redi-
[illegible]

[illegible]	[illegible]	Et distantia Solis a Terra ex cap. XXX.
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible] 46 ♎	99800 [illegible]
[illegible]	[illegible]	99667 [illegible]

[illegible] debita ratio haec est. Cum
[illegible]

δ, ι, γ ad sinistras, $\varepsilon, \varkappa, \lambda$ ad dextras eccentrici [illegible]
datae sint lineae $\alpha\delta$, $\alpha\varepsilon$, $\alpha\varkappa$, $\alpha\lambda$, $\alpha\gamma$, et anguli [illegible]
assumam tertium commune in omnibus triangulis [illegible]
nempe quaesitorum, et per hoc latus inquiram angul[illegible]
$\alpha\iota$ in eundem zodiaci locum statuent (nisi quatenus [illegible]
noctiorum is in sequentibus temporibus est promo[illegible]
sum, assumtum $\alpha\iota$ bene habere.

Methodi ratio haec, quod ut $\alpha\iota$ ad angulos δ, [illegible]
$\alpha\varkappa$, $\alpha\lambda$, $\alpha\gamma$ ad angulos ι.

$\gamma\alpha$	28°31′30″ ♓	$\delta\alpha$	9°22′37″ ♓	$\varepsilon\alpha$	25°21′18″ ♑	$\varkappa\alpha$	10 [illegible]
$\gamma\iota$	29. 18. 30 ♋	$\delta\iota$	15. 12. 30 ♌	$\varepsilon\iota$	2. 8. 30 ♎	$\varkappa\iota$	2 [illegible]
$\alpha\gamma\iota$ 122. 46. 54		$\alpha\delta\iota$ 155. 49. 53		$\alpha\varepsilon\iota$ 113. 12. 28		[illegible]	

Horum sinus in distantias Solis et Terrae [illegible]
distantiam $\alpha\iota$ 166700 *divisi, produnt sinus* [illegible]
visiones Martis in γ, δ, ablatis visionibus ex ε, $\varkappa$, λ [illegible]
in haec loca

γ	δ	ε	
29° 30′ 44″ ♌	29° 18′ 12″ ♌	29° 19′ 21″ ♌	29° [illegible]
Debuit in			
[illegible] 30. 01	29. 26. 0	29. 29. 30	[illegible]
29. 20. 51	29. 47. 0	29. 49. 30	[illegible]

[illegible]

Fig. 34.



$\varkappa$, λ in [illegible]
[illegible]
hosce distribu[illegible]
nihil in [illegible]

[illegible] accedamus, ubi catalogus [illegible] et [illegible] motus medii ostendunt proximas observationibus:

[illegible] vesperi fuit ♂ in 20° 59⅓′ ♑, cum lat. [illegible] mer. [illegible] 10′ in 18° 36′ ♑. Lat. [illegible] mer. [illegible] h. 1⅒ in 17° 33⅓′ ♓. Lat. 6° 6⅓′ mer. [illegible] Aug. [illegible] in 16° 7⅓′ ♓. Lat. 6° 18⅓′ mer.

[illegible] autem tempora in hunc modum:

		♂		⊙		Dist. Solis et Terrae
[illegible] h. [illegible] p. m.		20° 59⅓′	♑	19° 13′ 56″	♍	98730
[illegible]	5. 42 „ „	14. 18⅓	♑	5. 47. 3	♎	99946
[illegible] Aug.	16. 14 „ „	16. 56	♓	23. 26. 13	♌	101183

[illegible] oportet nos uti confidentia, diurnos eosdem esse cum [illegible]; nam observatio solitaria est. Ac cum in Magino moveatur [illegible], fuerit ergo Mars 19. Sept. h. 7⅓ in 14° 20′ ♑, [illegible] 18⅓ ♑. Circa stationem in 16. vel 17. Julii promotior [illegible] per 1° 46′ circiter quam apud Maginum. Jam 26. Sept. [illegible] est promotior. Diebus itaque 70 deminuta est differentia [illegible] etiam proportionaliter argumentemur, grandior erit 19. Sept. [illegible] circiter 2′. Credemus igitur, Martem ad nostram horam [illegible] ♑.

[illegible] abit. Et cum 30. Julii locus Martis [illegible] meridiano Magini per 3° 25⅓′, [illegible] ut augeatur differentia, [illegible] 5. Augusti 3° 40, [illegible] et diurnus 10′. [illegible] debentur circiter 4′ de retrogrado motu ♂. [illegible] ♓. Certum est, [illegible] quidem [illegible] aberrare.

[illegible] est [illegible]. Nam anno 1595. [illegible] in Dania [illegible] Tycho Brahe [illegible]. Prope [illegible] vero [illegible]

[illegible]

plus hic peccatur in propinquitate ... *sima longitudo ipsius* $\alpha\vartheta$ *erit* 138480 ...

Inclinatur hic planum (ut et prius loco oppo... abundat supra radium particulis 49. ... 49 ad 68. Ergo correcta longitudo radii ... his quidem observationibus longe deductis.

Ex his inquisitio ...

Assumitur respectu omnium trium observationum ... anno 1589. d. 1. Nov. h. $6\frac{1}{6}$ post merid. in 29° ... 1591. in 29° 56′ 30″, et anno 1593. in 29° ... thesis capitis XVI. exhibet illam primo tempore ...

Prius autem assumsimus similiter α anno 1588. ... in 29° 20′ 12″ ♌.

Cum ergo ab anno 1588. d. 22. Nov. ... 1589. d. 1. Nov. h. 6. 10′ sint dies 344 minus ... revolutio ad eandem fixam habeat dies 687 ... nostrum intervallum paucis horis excedere medietatem ...

Ecce Dies 343. h. 11. 46′ dimidia ...
343. " 21. 52½′ nostrum ...

Excessus " 10. 6½.

Et cum prioris temporis loco 29° 20′ 12″ ... erit ♂ tempore posteriori 29° 54′ 52″ ... ... 48″ ... 180° 23′ 52″ ...

[illegible] ipsius fidei tribuendum, incertum. Nam facile [illegible] assumtione linearum α ε, ε δ propter observatio- [illegible] 4', duobus hinc, duobus inde, quanquam quidem [illegible] accumulari oportet, ut aphelium 2'. [illegible] non fidere operationi praesenti.

[illegible]

Correctio motus medii.

[illegible] aphelii mutatur et motus medius. Nam si quo tempore [illegible] aphelii inquisitionem ♂ existimatur incidere in aphelium, [illegible] eodem tempore jam superavit aphelium minutis 2: habet [illegible] 2 minutorum subtractoriam. Itaque medio motu superavit [illegible] locum medium per 4.

Eccentricitatis inquisitio.

[illegible] distantiae prius inventae si opus est, [illegible] aphelibus jam inventis distent aphelia per 40', perihelia [illegible] sensibile mutatur in tanta propinquitate ad apsidas. [illegible] 166780 scilicet αε [illegible] 138500 scilicet δθ

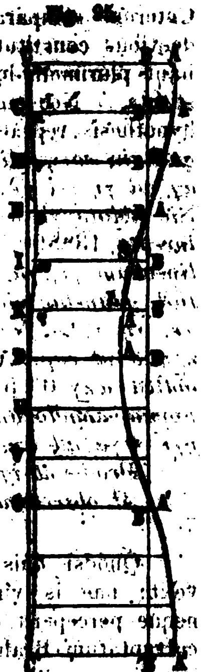
[illegible] 305280 [illegible] 152640 semidiameter βθ [illegible] 14140 [illegible] αβ. [illegible] 100000, sic 14140 ad 9264 eccentricitatem [illegible] 9265 [illegible] Differentia [illegible]

[illegible]

jam cap. XLI. nos de eo jussit dubitare. [illegible]
eccentricitas, capite XLII. inventa 9264, [illegible]
aequationis opticam 5° 17′ 34″. Et quia in [illegible]
trianguli est rectangula, ducto igitur radio in [illegible]
4632, provenit area trianguli 463200000. Ut autem [illegible]
ad 360° sive 1296000″, sic haec jam inventa area [illegible]
seu 5° 18′ 28″ partem aequationis physicam. Itaque tota [illegible]
ut ita anomaliae mediae 95° 18′ 28″ respondeat [illegible]
At secundum methodum capitis XVIII. vicaria hypo[illegible]
gitudine, ostendit nobis, quod eidem anomaliae [illegible]
spondere debeat coaequata 84° 42′ 2″. Differentia [illegible]

Sumatur jam anomalia eccentri nostri 45° [illegible]
sinus horum angulorum, ita area 19108″ maxima [illegible]
aream hujus loci 13512″ sive 3° 45′ 12″ [illegible]
aequationis physicae ad anomaliam eccentri [illegible]
48° 45′ 12″ et 138° 45′ 12″. Datis vero [illegible]
prodeunt anguli anomaliae coaequatae his [illegible]
41° 28′ 54″, 130° 59′ 25″ [a]). At per vicariam [illegible]
operis, assumtis iisdem anomaliis simplicibus 45° [illegible]
prodeunt coaequatae illic 41° 20′ 33″, minus [illegible]
excessus 8′ 21″, hic 131° 7′ 26″, plus [illegible]
fectus 8′. Itaque cum certum sit, vicariam [illegible]
non posse, necesse mihi fuit credere, [illegible]
impendisse. Et capite quidem XIX. [illegible]
et per immobile punctum [illegible]

[illegible]



[illegible] lineæ videlicet EA. Ex hoc igitur [illegible] lineola BA, pars lineæ EA, prope- [illegible] accumulationem omnium horum [illegible] EA, BA, SA, LA, in hunc modum: [illegible] tangens compositi tantundem [illegible] omnium graduum totius semicir- [illegible] Cardano in libris de Subtilitate, [illegible] proprietates explicat. Ejus rei demon- [illegible] Justus Byrgius.[34])

[illegible] nostri omnes residui a maximo [illegible] utrinque in semicirculo ad semi- [illegible] ut 100000 ad summam secantis et [illegible] ad 11458869, sic esset 432 ad [illegible] omnium excessuum ad singulos gradus [illegible] quanto distantiarum excessus in [illegible] sunt longiores his secantum excessi- [illegible] quadrante fere sunt breviores: [illegible] excessus QA, RA, SA &c. ad [illegible] torum graduum, sed fere [illegible] dupla. Ut sinus 90° est duplus [illegible] optica 90° est 5° 19', ejusque [illegible] itidem fere dimidium [illegible] pro aequatione optica ano- [illegible] est 100107. Et hic [illegible] fere quarta pars prioris 432; [illegible] de sinu [illegible]. Videat geometra aliquis [illegible] Mihi sufficit in praesens, minima, in quibus [illegible] 432 accumulantur, partes non proportionales [illegible] et in 45 [illegible] tantummodo [illegible]

[illegible]

Ceterum comparatione eorum, quae ... dentibus constituta sunt, facilè apparet ... bant plurimum loca aphelii, eccen... ... Nec aequationes physicae ... hypothesis repraesentat, consentiebant. Repetat ... *quis in eo qualium γη 100000, talium ...* *αγ ad γη vel γε, esset αε 166362, quae ...* *Sic ablata γα à γδ restaret αδ, 136918, quae* *inventa 138500. Rursum quia cap. XLII ...* *linearum γε, γα, αε, αδ, si ergo, quod ...* *fuit, planetae via est circulus, non est ...* *ακ, αη, αθ. Nam quia αε est anno 1590 ...* *κ, η, θ ut cap. XLI: erunt dati anguli ...* *optica ακγ* 0° 53′ 18″, *αηγ* 3° 10′ 24″ ... *horum ... ad verissimam eccentricitatem ...* *ηγε, γα ad αη, ...* *igitur αε ...* *... ...*

Quodsi quis, hanc differentiam ... velit: nae is vim demonstrationum ... neque perceperit oportet, et ... corruptarum Brahei observationum ... quentium provoco, quas ... ... qui ...

[illegible] et perihelio proximae metientur tempus majus, quia [illegible]; sed partes in longitudinibus mediis metientur [illegible], quia in illis accidit potissima tocius plani [illegible] si utamur hoc diminuto plano ad moderandas aequatio[nes] circa aphelium et perihelium tardior, quam in priori [illegible], circa longitudines medias velocior, quia [illegible] igitur hinc abstractae in aphelium et perihelium [illegible] compensatione facta accumulabuntur, non secus ac si [illegible] in medio comprimat, eaque compressione minutal[illegible] magis in utrasque extremitates infra supraque manum [illegible] elidat.

[illegible] contrariis medentur, haec plane aptissima est medi[illegible] quibus supra cap. XLIII. physica nostra hypothesis [illegible]. Velocior enim futurus est planeta in longitu[dinibus mediis] [illegible] prius ibi deprehenderetur justo tardior, retardabitur [illegible]; ubi prius pernicitate nimia nocebat aequatio[illegible] redundantibus.

[illegible] argumentum est, quo demonstratur, orbitam planetae [illegible] deflectere ad latera centrumque eccentrici [illegible] argumentum penes me non tanti fuit, ut ex eo de pla[illegible] possem. Diutissime enim in conciliandis hujus [illegible] tandem absurditate mensurae deter[illegible] de exorbitatione edoctus, [illegible] postea [illegible] etiam aequationum negotium [illegible]

circularem perfecte, statim magno persuasionis [illegible] riam, quae cap. XXXIX. absurda dicebantur ad [illegible] probabiliorem formam transmutatis [illegible] tae orbitam effectum iri. Quodsi [illegible] potuissem statim ad veritatem [illegible] pervenissem. At [illegible] cupiditate, nec ad omnia et singula membra cap. [illegible] haerens illi cogitationi, quae se primam offerebat [illegible] dum ob aequabilitatem motus epicycli, in novas [illegible] bus capite hoc XLV. et sequentibus usque ad [illegible]

Repetatur itaque schema cap. XXXIX. [illegible] fuit, planetam, ut perfectum circulum describat, [illegible] et sic explicare corpus suum a radio virtutis ex Sole [illegible]

Fig. 66.



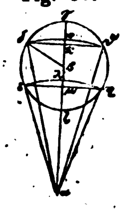
ex Sole sit AC [illegible] passu ex AC [illegible] A [illegible] in C, [illegible] ex AC vel $A\gamma$; [illegible] $A\gamma$, planeta ex C [illegible] faciat [illegible] incitat [illegible] AC. Hoc [illegible] epicycli et planetam [illegible] lineae AB. [illegible] [illegible] sese explicando [illegible] sese acce[illegible]

[illegible] ex Sole, ejusque [illegible] ne hoc absurdum videtur, [illegible] AC [illegible] est aequaliter. Videamus, an aliquid [illegible] antecedentia ex observationi[illegible]

[illegible] igitur centrum [illegible] tardem [illegible] ex C in [illegible] ex [illegible] D [illegible]

erentur sursum, breviores in locum longiorum. Itaque confirmari coepit in
ie error iste, quem suprà cap. XXXIX. feliciter refutare coeperam, pla-
etariae virtutis proprium esse, planetae corpus in epicycli semita cir-
ımducere. Si diameter epicycli ND mansisset ipsi AB aequidistans, poteram
xuisse hanc meam opinionem erroneam, poteramque, quod est verissimum,
mnem promotionem in longitudinem zodiaci transscribere Soli,
›lam planetae librationem in diametro $\gamma\zeta$ relinquere, ut in parte
ıp. XXXIX. Sed quia observationes testabantur, hanc dia-
ıetrum epicycli inclinari in longitudinibus mediis, id admira-
iliter me confirmavit in errore hoc de motu planetae in ipsa
picycli circumferentia, cujus motus esset regularis a linea ANγ,
x A Sole per N centrum epicycli eunte. Cogita ipse lector,
; vim argumenti persentisces, quia non putavi fieri ullo alio
edio posse, ut planetae orbita redderetur ovalis.

Fig. 97.



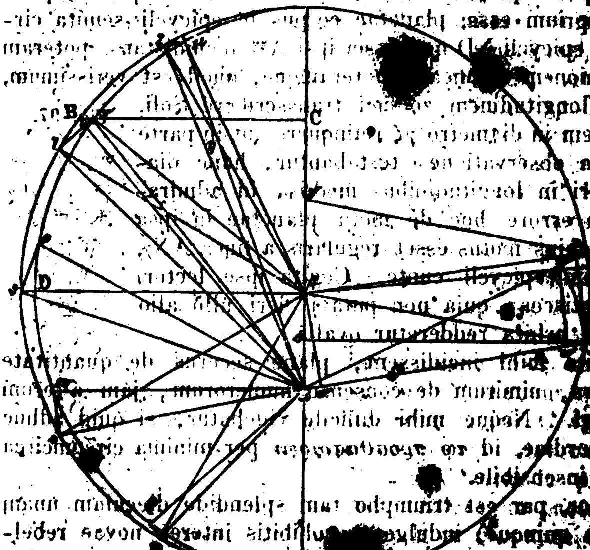
Haec itaque cum ita mihi incidissent, plane securus de quantitate
ıjus ingressus ad latera, nimirum de consensu numerorum, jam alterum
ı Marte triumphum egi. Neque mihi difficile videbatur, si quid adhuc
ter numeros esset discordiae, id τῳ προσθαφαιρειν per minima circumcirca
ssipare, ut redderetur insensibile.

Ac nos, bone lector, par est triumpho tam splendido dieculam unam
apita inquam sequentia quinque) indulgere, cohibitis interea novae rebel-
›nis rumoribus, ne apparatus iste nobis citra voluptatem pereat. Si quid
›inceps erit, suo tempore et ordine peragemus: jam quidem hilares, tunc
ıtem gnavi et strenui.

Caput XLVI.

uomodo describi possit linea motus planetae ex opinione capitis XLV, qualisque ea sit.

Capite superiori causa quidem dicta est, qua fieri possit, ut planeta
circulari orbita aberret: delineatio vero geometrica itineris nequit per
ıd schema expediri. Nam epicyclus inclinatur pro longitudine distantiarum:
tantiarum autem multitudo et longitudo vicissim ex epicycli conversione
ıdet. Et quia summa distantiarum inest in plano eccentri, ut cap. XL.
nonstratum, nequit igitur inveniri ea summa, nisi epicyclus hic in
entricum transmutetur. Est autem demonstratum cap. II. et repe-
ım cap. XXXIX. et usurpatum cap. XL, quod si scribatur ex centro
concentricus semidiametro aequali ipsi $\beta\delta$, inque eo epicyclus semidiametro
; scribatur deinde centro β eccentricus $\delta\lambda$ eccentricitate $\alpha\beta$; et postea
idantur circumferentiae, cum epicycli tum eccentrici $\delta\lambda$, in partes similes:
›d distantiae punctorum divisionis cum epicycli tum eccentrici a suscepto
ıcto α fiant utrinque eadem longitudine. Hoc praemisso, cum cap. XL.
suppositionem eccentri facilem et planam tradiderimus demonstrationem
thodumque computandi distantias: hic quoque distantias nos in eccentro
culari possumus, etsi ponimus, illas motu aequabili epicycli planetae



tur puncta divisionis cum α et [illegible]
mere fictitius: tantum pro co[illegible] summa [illegible]
Quodsi planeta tam in δ qu[illegible] in λ aequali [illegible]
veretur, quemadmodum jam ipse [illegible]
aequabiliter moliri ponitur, tunc [illegible]
quibus distantias desumsimus, [illegible]
temporum per signa divisio[illegible]
[illegible]

[illegible] planum $\delta\alpha\epsilon$ [illegible] &c. habet in se summam distantiarum [illegible] arcu epicycli, qui similis est ipsi arcui $\delta\epsilon$ per cap. XL, [illegible] aequalibus temporibus (quae jam per $\delta\epsilon$, $\epsilon\beta$ mensurantur) [illegible] describit [illegible] [illegible]ris; breves quidem, quando ab [illegible], longas vero, quando ad Solem prope accedit, sic ut [illegible] planetarii, qui decurruntur temporibus aequalibus, sint in proportione conversa per cap. XXXII; igitur fere fit, ut quanto area [illegible] anteriorem $\alpha\beta\delta$, cujus mensura est angulus $\alpha\beta\delta$ vel arcus [illegible] $\epsilon\delta$ (hoc loco mensura temporis) excedat arcum itineris [illegible]

[illegible] totum efferas numero 360, eodem nempe, quo circum[illegible] tempus periodicum, tunc numerus temporis seu $\delta\epsilon$ [illegible] est medium seu arithmeticum seu geometricum [illegible] inter numerum summae distantiarum seu spatium [illegible]rum itineris planetarii seu $\mu\delta$. Multiplex hic occurrit [illegible], quod planum circuli non perfectissime aequivalet summae [illegible] demonstratum est capite XL, etsi fine capitis XLIII [illegible] admodum esse defectum. (In tollendis incommodis vero [illegible]

[illegible] proportio jam dicta non [illegible] exquisite geometrica. Nam [illegible] ad singulas [illegible] in proportione conversa [illegible] mediocres: summae tamen [illegible] proportio non manet [illegible] mediocrium conversa [illegible]

[illegible] 12 et 8; sic [illegible] 8, 9, [illegible] 17. [illegible] cap. XXXII. [illegible]

lus. Itaque etsi hoc subsidio est iis, qui [illegible]
$\varepsilon\beta\zeta$ esse medium inter $\varepsilon\alpha\delta$ et $\mu\beta\delta$, [illegible] tamen [illegible]
affectamus, hac non patet transi[illegible]

Alia igitur tentabimus. [illegible]
temporis est $\delta\varepsilon$, $\delta\zeta$ pro inquirendis distantiis [illegible]
$\delta\beta\varepsilon$, $\delta\beta\zeta$ eadem est proportio mutua, quae arcuum [illegible]
itinere planetae planum inter arcus itineris et [illegible]
est vere mensura temporis, quo planeta versatur in [illegible]
cap. XL: ergo ex α diametri puncto rectae ejiciantur [illegible]
aequalia ipsis $\varepsilon\beta\delta$, $\zeta\beta\delta$; ut $\varepsilon\eta\mu$ spatium, quod [illegible]
aequale spatio $\mu\alpha\beta$, quod accedit eidem [illegible]
centro α diastemate $\alpha\varepsilon$, $\alpha\zeta$ arcus ducantur [illegible]
in μ, ν. An igitur puncta μ, ν, o, [illegible] hoc [illegible]
sic ut planeta temporibus $\delta\varepsilon$, $\delta\zeta$, $\delta\theta$ [illegible] in illa [illegible]
verum hoc est: sed tamen tria et hic desiderantur [illegible]
quod planum non exacte aequivalet summae distantiarum [illegible]
via geometrica nulla est, quae doceat, datum semi[illegible]
puncto per rectam lineam in data proportione [illegible]
citur, ab cuilibet plano $\mu\alpha\delta$, $\nu\alpha\delta$ &c. tantum in pro[illegible]
deflexionem μ, ν a circum[illegible]
Verumtamen et haec utilia [illegible] iis, qui [illegible]

[illegible]

[illegible] *coaeq*[illegible] *ipsius* AH *locus verus sub zodiaco,* [illegible] *linea* [illegible] *sub tempus et anomaliam datam, per* [illegible] *distantia* AH *falsa erit, et planeta non in puncto* [illegible] *et eccentricus* [illegible] *ex* C *descriptus falsi sunt, per* [illegible] XLII, *ubi ostensum est, ipsam* AD *bisecandam in* [illegible] *eccentricus* IL *scribatur, non tamen* [illegible] *perfectus* [illegible] *jam et altera hypothesis. Et bisecetur* AD *in* B, [illegible] *(vel secundum numeros cap.* XLII. *sit* 9264) *et centro* [illegible] *scribatur alius eccentricus* IL, *quem hoc capite* [illegible] [illegible]), *computandis justis distantiis descriptum.* [illegible] [illegible] *in schemate 98.* [illegible] λ, *centro* β *descriptus. Et trans-*[illegible] *(quae pr*[illegible]*bis, mediante tempore, fuerat pro-*[illegible] *ex* B [illegible] BF, *quae sit parallelos priori* DH. [illegible] *sectione* [illegible] *eccentrici cum* A. *Per ea igitur,* [illegible] *dicta sunt, erit* AF *distantia (quam requirit hypo-*[illegible] *planetae in* F) *a centro Solis in* A. *Sed angulus* [illegible] AF *sub zodiaco falsus. Planeta enim ad susceptam* [illegible] *medium non invenitur in* AF. *Prius autem vera* [illegible] AH, *et falsa longitudo* AH. [illegible] *igitur* A *distan-*[illegible] FG, *secans* A[illegible] G. [illegible] *igitur linea* AG [illegible] *falsis hypo*[illegible], *vera tamen in situ sub* [illegible]

[illegible]

los, et sectionum punctis intelligere [illegible] inata [illegible]
rum. Respondetur, quod non. Peccab[illegible] enim [illegible]
tias nimis alte sursum transferentes, p[illegible] ale [illegible]
riore. Semper enim in eo linea [illegible] H, versa distan[illegible]
inferior linea DH, ex puncto aequatorio in parallel[illegible]

Quocunque dictorum modorum delineatur linea [illegible]
dens, sequitur jam, viam hanc punctis λ, μ, π, o, ρ, [illegible]
ovalem, non ellipticam, cui mechanici nomen ab ov[illegible]
(Ovum). Ovum enim duobus turbinatum verticibus [illegible]
[illegible] acutiori, et lateribus inclinatis cernitur, [illegible]
creasse. Nam quia planeta in λ celerior est, in [illegible]
illic quam hic tardus, eo quod [illegible] distant[illegible]
cedentium plures sint quam brevium [illegible] usque [illegible]
inde per $87\frac{1}{3}$° breviores, quod sequ[illegible] doctrin[illegible]
patet); atque insuper illae plures longae in [illegible]
translatione facta sursum stipatae, hae pauciores [illegible]
ita ut anomaliae mediae $92\frac{2}{3}$° *), qua distan[illegible]
spondeat anomalia eccentri $87\frac{1}{3}$° circiter; resid[illegible]
cum totidem distantiis brevioribus radio [illegible]
centrum eccentrici [illegible] duc[illegible] [illegible]° [illegible] Longi[illegible]
breves distantiae circa pe[illegible] quam [illegible]
eadem etiam esset propor[illegible]
retur resegmentu[illegible]
ρ, π, λ; quia in o [illegible]
quam in λ. At je[illegible]
perihelio propinqua[illegible] proportio[illegible]
partium, aphelio pro[illegible]
concheidis spatium [illegible]
igitur intervallis per [illegible]
necesse est infra, quam [illegible]
ad breviores lineas: prop[illegible]
[illegible] pare[illegible]
[illegible]

[illegible]ntrici et mora [illegible]rum illam partem aequationis [illegible], [illegible] appellare sole[illegible] [illegible]oram vero, si quicquam aliud, planum [illegible] [illegible]re pla[illegible]e compendiosissime (licet non perfectis-[illegible] [illegible] igitur ad dimensionem eccentrici [illegible] plani, [illegible] sunt praemissae. Nam etsi parum aliquid nobis [illegible] hanc temporis mensuram statuamus (illud [illegible] [illegible]circumferentiam magis etiam quam ad circularem inclinet [illegible] circumferentiae illius cum fonte virtutis connectunt; [illegible] lineae, quae ex centro eccentrici ad easdem illas [illegible] [illegible] alias radii ex centro ad perfecti circuli circum[illegible] [illegible] sint), unde sequitur, ut nec [illegible] distantiarum exacte [illegible] nec arcus eo[illegible]nt exacte proportionales distantiis: [illegible] ex relectio[illegible]p. XL. et XXXII. [illegible] parvum [illegible], ex cap. [illegible] conjecturam capere [illegible]. [illegible] planum hoc aliter metiri, ad p[illegible]num circuli comparare, [illegible] dividere possimus, nisi quadratum inveniamus aequale [illegible]lunulae resectae? Hic igitur accersendus nobis e tragoedia [illegible] qui nos doceat machinari quadraturam [illegible] schemate [illegible], seu lun[illegible] cujus abscissione ex [illegible] generetur. [illegible] igitur [illegible] cap. XL. in [illegible] [illegible] iterum in eoide[illegible] [illegible] forte [illegible], metoposide) [illegible]

[illegible] ab Archi- [illegible] libro de [illegible] VII. VIII. [illegible] [illegible] majori diametro [illegible]

[illegible]

pendicularis $\tau\chi$; sic ex ξ in $\alpha\tau$ p[illegible]dicularis [illegible]
parallelos $\gamma\varphi$, $\beta\tau$ recta $\alpha\gamma$ incidat, [illegible] erg[illegible]
autem et $\gamma\beta$ ipsi $\alpha\beta$ ex constructione; [illegible] $\beta\varphi$ [illegible]
enim eidem $\beta\tau$ aequalis est ex constructione. [illegible]
triangulo $\beta\tau\alpha$ congruit, quare $\gamma\varphi$ ipsi etiam $\beta\tau$ [illegible]
paralleli ex constructione, quare et $\beta\gamma$, $\tau\varphi$, [illegible]
extremis connectunt ab eadem plaga, paralleli et [illegible]
aequalis est ipsi $\alpha\beta$, ergo aequales sunt et paralle[illegible]
[illegible], erunt paralleli. Et quia anguli ad χ, [illegible]
[illegible]qualis, et angulus $\beta\alpha\tau$ vel $\beta\alpha\nu$ angulo [illegible]
aequales $\alpha\tau$, $\chi\varphi$; [illegible] perpendicul[illegible] $\beta\nu$, [illegible]

Rursum, quia aequales $\tau\chi$ et [illegible] paralleli [illegible]
autem et β[illegible], et anguli ad χ, [illegible] erunt [illegible]
triangulorum [illegible]tera $\beta\chi$, $\alpha\xi$; aequal[illegible] vero [illegible]
parallelos β[illegible] [illegible]qualibus igitur $\beta\xi$, [illegible]
[illegible] aequales. Posita autem et $\chi\varphi$, $\alpha\nu$, erunt [illegible]
[illegible] ad $\alpha\nu$ [illegible]

His demonstratis, ad propositionem [illegible]
quia in $\varphi\beta$ diam[illegible] (quae [illegible]
aliorum circumfer[illegible] ex puncto [illegible]
[illegible] incidit, [illegible] $\pi\chi$ [illegible] ad [illegible]
Rectangulum igi[illegible] sub [illegible]
drato $\pi\chi$. Et [illegible]
aequalibus igitur [illegible]
aequale quadr[illegible]

Est autem pla[illegible]rum proportio dupla [illegible] proportionem [illegible] ut $\beta\varphi$ *[illegible]000 ad* $\beta\alpha$ *926[illegible] sic* $\beta\alpha$ *ad* $\xi\varphi$ *858, [illegible] inter [illegible] et* $\xi\varphi$ *proportionis, quae est inter* $\beta\varphi$ *[illegible] 100000 ad* $\xi\varphi$ *858, sic planum circuli* 314[illegible]900000 [illegible] 269500000. *Subtracto igitur plano circuli, restat* [illegible]114[illegible]400000, *aequivalens* 360 *aequalibus partibus temporis* [illegible]

[illegible]icta, ea sunt quidem consona opinioni cap. XLV. [illegible] eorum non sufficit, sciri amplitudinem plani [illegible] calleamus necesse est, dividendi illius ex centro [illegible] data. Exempli gratia in schemate priori sumatur [illegible] planeta in linea $\alpha\vartheta$, recesserit tamen a circum[illegible] α. Data [illegible] eccentricitate $\beta\alpha$ et angulo $\vartheta\alpha\beta$, [illegible] sit in circumferentiae puncto ϑ, [illegible] angulus [illegible] perfecti circuli, scilicet $\vartheta\delta\beta$ et area [illegible] anguli $\vartheta\beta\alpha$, [illegible] quae (exceptis quae supra cap. XL.) debuisset [illegible] quod elapsum est, quoad planeta ex δ in ϑ venit, si [illegible] $\delta\vartheta$ iviss[illegible]t. Sed [illegible] ovalem interiorem describit, [illegible] perfe[illegible] circuli area [illegible] quidem ut jam modo nobis [illegible] [illegible], sic [illegible] etiam scitu nobis opus est, [illegible] $\alpha\vartheta$ interc[illegible]tur, hoc est planum partis [illegible] de plano, quod utramque lunulam metitur, [illegible] eccentricitatis. Hoc [illegible] a portione cir[illegible] relinqu[illegible] [illegible] per easdem lineas [illegible] totum oviformi [illegible] suam $\delta\alpha\vartheta$ recta [illegible]

hucusque constiterit, methodum deinde [illegible] arëolas inter rectam CED et curvam CD [illegible] dixi excello eccentricitatis (duae enim [illegible] areola jam ponitur dupla ad unam lunulam) [illegible] ad quamcunque datam longitudinem partium [illegible] planum inter CD et EB comparetur.

Rursum autem, ut prius cap. XLVI, quia nobis [illegible] patet liber exitus, paciscemur cum [illegible] et [illegible] cap. XLV. nata opinio, quae nos in has difficultates [illegible]

[illegible] itaque schema 98. Quodsi planum [illegible] perfecta esset ellipsis [illegible] descripta ellipsi [illegible] communi longiori diametro [illegible], et [illegible] latere longioris diametri divisis [illegible] ordinatim [illegible] perpendicul[illegible] ad longiorem diametrum [illegible] [illegible] ad [illegible] circuli BAC in eadem [illegible] demonstrant conici auctores, et Archimedes [illegible] [illegible]. Tunc igitur ne quidem opus [illegible] Pro plano enim ellipsis [illegible] circuli [illegible] partes circuli adhib[illegible]

Esto [illegible] ellipsis [illegible] punctorum ellipsis, puta [illegible] et continuetur [illegible] Quia ergo, ut [illegible] sunt ut prop. [illegible] ad circuli [illegible]

[illegible]

[illegible] *dat* 463200000 *aream* $\theta\beta\alpha$. *Summa areae* 8317181[illegible], [illegible] *admodum exiguo superat debitam.* [illegible] [illegible] *seu anomaliam eccentri esse* 90°. *Et quia* [illegible] *lunulae apud* θ *scilicet* θD *erit* 858: *quare* [illegible] Dβ *erit* 99142, *quae sic se habet ad* 100000, *ut* [illegible] *tangit* 5° 20′ 18″ *angulum* αDβ, *ut sit anomalia* [illegible] 84° 39′ 42″, *quam exhibet* [illegible] *hypothesis* 84° [illegible],

[illegible] obiter, quia eccentricitatis inquisitio cap. XLII. niti- [illegible] et periheliis, et in his minimum aliquid errari [illegible], [illegible] constitutione excrescit in [illegible]; ideoque, si in- [illegible] absolutissima ratio aequandi per causas physicas, posset [illegible] verissima eccentricitas et per eam corrigi omnimode [illegible] aphelii et perihelii. Ut quia [illegible] nimis [illegible]gna fit ae- [illegible] (si modo et vicariae [illegible] de plan[illegible] longitudinis [illegible] cap. XLV. assumta vera ponimus); [illegible] [illegible] aequationis causa in longitudinibus me[illegible] [illegible] 1′ 10″ subtraheretur angulo [illegible] [illegible] 8″, quo[illegible] 9310 tangens; prius [illegible] eccen[illegible] relinqueret 9230 cor- [illegible] Sed [illegible] jam [illegible] sequemur, quia assumta in [illegible] meminisse in futuros [illegible] capitum proxime se- [illegible] quid in octavis temporum [illegible] [illegible] Sit, ut cap. XLIII. anomalia [illegible]

[illegible]

[illegible] mediae communes.	Per simplicem eccentricitatem.	Per bisectionem eccentricitatis et duplicatonem aequationis partis superioris.	Per bisectionem eccentricitatis et [illegible] [illegible] nium, more Ptolemaico.	[illegible]
respondent	coaequatae	anomaliae		
[illegible] 12″	41° 40′ 14″	40° 45′ 52″	41° 15′ 31″	41° [illegible]
[illegible] 28	84. 40. 44	84. [illegible] 48	84. 41. 22	84. [illegible]
138. 45. 12	130. 40. 46	131. [illegible] 0	131. 15. 31	131. 7. [illegible]
		Excessus et defectus in contrarium vergunt, si duplicetur [illegible] inferior.		
	Cap. XX. et XXIX.	Cap. XXIX.	Cap. XIX.	Cap. [illegible]

Duarum igitur physicarum hypothe[illegible] [illegible] illa exhibet aequationes veritati pr[illegible] [illegible]stantias veriores dederat, posterior [illegible] levi augmentatione eccent[illegible] aequip[illegible] bile punctum aequatorium, [illegible] acce[illegible]

Et cum hanc Ptolemaic[illegible] supra [illegible] illam physicam, quae[illegible] hac in effectu [illegible] deflectere. Tardus quippe fit planeta circa [illegible] longitudines medias. Quid primum [illegible] [illegible] esse opinionem cap. XLV. [illegible] [illegible]

[illegible] non erat exquisita mensura summae distantiarum, [illegible] ipsas computavi singularum circumferentiae [illegible] Secundo, quia proportio non manebat eadem, [illegible] proportionum terminis, igitur singulas singularum di[illegible] ad suos arcus minimos consului seorsim. Tertio, [illegible] distantiarum cap. XLVI. non potuit constitui geometrice, [illegible] arithmetice, nihil enim impediebat. Quarto, hoc mihi [illegible] negotium cum sectoribus sive circuli sive ovalis: itaque [illegible] obstare potuit, quod illi sectores inter se differrent [illegible] in id incubui, ut scirem vel tandem, an ex [illegible] distantiarum hypothesi (nimirum ex opinione cap. XLV.) [illegible] aequationes per vicariam nobis manifestatae.

[illegible] aggressus. Centro B, diastemate BD, scribatur circulus [illegible] apsidum DB, et A [illegible] virtutis, [illegible] Sumatur in circulo D[illegible] punctum G, [illegible] Fig. 101. [illegible] B [illegible] A, et sit initio GBD angulus [illegible] computandae distantiae. Ergo propterea [illegible] A, quamvis planeta ex D [illegible] haec ra[illegible] computandi [illegible] ex [illegible] XLV. in [illegible] DG pars circuli [illegible] ut [illegible] distantiae AG [illegible] ad [illegible] D et G hoc modo compu[illegible] cap. XXIX, collegi igitur [illegible] longissima additione in unam [illegible] 36075562 (eccentricitate [illegible])



[illegible]



[illegible]

Sic igitur data longitudine DC priscis schematis ... DG et distantiae GA, hoc est CA ... angulum CAD anomaliae coaequatae. Connectatur ... tur AC in E, ubi secet circulum, BC vero in ... igitur scire longitudinem DC, oportuit etiam inv... Nam quia CD brevior est quam FD, non ... hoc est CBD. Et vicissim, etsi CD brevior est ... ex B apparet, si fingas oculum in B, quanta FD ... Et quia (secundum demonstrata cap. XXXII) ... subtilitatem, quod quanto a B remotior est FD ... sit FD quam CD; quia etiam verum est, ad ... gotii quantumvis acutissimam subtilitatem, quod ... longior quidem in rei veritate est CE quam ... Eucl. III, 7): ergo posui primo, quod CD et FD ... sit mensura anguli CBD, ... est FBD vel ... insensibilis esset. Dabatur igitur angulus ... triangulo igitur EBA ex angulo EBA et ... tudinem AE, unde subtr... AC vel AG ... CE vel CF appropinquatio ... igitur CE (nam hoc ... licet) ... ad B, si aequabiliter omnibus punctis ... vero et parallaxis ... seu visibilis quantitas ... angulus CBD jam correctus, qui prius ... numeris ... error. Dato igitur jam ... complemento ipsius CBA, et latere CA ... anomalia coaequata CAD ...

[illegible] HK, tangens priorem in K. Manifestum sit, circulum [illegible] quam DK, et circulum DGR majorem esse quam [illegible], [illegible] circumferentiae sunt inter se invicem ut earum semidiametri [illegible] et BH, sic circulus major DG ad minorem DK et KH. [illegible] medium arithmeticum inter DB et HB, quia BI est dimidium [illegible] circulus DK, tangens minorem et majorem in eodem [illegible], est medium arithmeticum inter illos circulos, quos [illegible] continuatur, ex supposito tangat et ipsa majorem [illegible] D et perihelio H, minorem vero HK in longitudinibus [illegible] major minori HK, minor majori circulo DR. Consentit [illegible] non longe abesse ovalem circumferentiam a longitudine [illegible] circumferentiae DK.

[illegible] credere facit haec demonstratio. Sumatur medium [illegible] BH et BD, quod sit BO, et centro B, [illegible] OP circulus. Itaque [illegible] V. Sphae- [illegible] planities hujus circuli OP erit aequalis [illegible] longior semidiametro BD, bre- [illegible] isoperimetron capacissima est [illegible] (per [illegible] notitiam) aeque [illegible] diametros ejus circuli. Cum [illegible] semidiametros DB, BH, et cir- [illegible] aeque capaces ex jam [illegible] erit longior, quam circumferentia [illegible] BO insensibili minor quam ID, eo [illegible] terminos possitur esse geometricum [illegible] arithmeticum. Per doctrinam enim [illegible] mediam proportionale inter HB, BD [illegible] sic HO [illegible] medium ad O [illegible] minor quam BD, erit [illegible] minor quam [illegible] At BI [illegible] major igitur est BI quam BO, minor [illegible] OD. [illegible] circuli HK semidiametrum HB, apponuntur [illegible] dimidia ipsius DH in BO, et dimidium ipsius DH [illegible] BO. Major igitur DK circulus quam OP [illegible] DH minor [illegible] quam centesima ipsius BB [illegible] abundanti aequalibus et posito, quod ovalis [illegible] ovalis circumferentia longior quam circulus [illegible] circulus OP [illegible] XVII. DH [illegible] dimidiam igitur DH [illegible] auferatur e DB [illegible] Ut igitur [illegible] sic sit [illegible] pro- [illegible]



Fig. 101.

c[illegible]ur), hinc non injuria dubitare possit lector [illegible]
o[illegible] primum totam ovalem decurtare, postea [illegible]
augere? Nam ex schemate videtur apparere [illegible]
maximam contingere, ubi et appropinquatio [illegible]
vicissim.

Quodsi pariter incederent hae variationes [illegible]
retur computandi aequationes:

Anomalia media primum esset GBD, [illegible]
GA, *quae addita ad* AD *distantiam termini* [illegible]
(qui semper est 1°) *et summa dimidiata* [illegible]
tiam aequabilem (omnium scilicet ejus punctorum) [illegible]
ut est longitudo semicirculi ad summam distantiarum [illegible]
circulo, sic esse hanc distantiam arcus GD *ad longitudinem* [illegible]
ad apparentiam ex B *ipsius* CD. *Jam ex* [illegible]
anguli CBD *et ex* AC, A[illegible] *quaereremus* CAD [illegible]
[illegible]*eviore via quam prius.*

At sciat lector, has duas varietates [illegible]
amplificatio optica, quae oritur ex appropinquatione [illegible]
B, potissimum accidit circa longitudines medias [illegible]
helio: at contra, decurtatio [illegible] ovalis [illegible]
ad centrum, circumcirca pene aequalis [illegible]
positae in longitudinibus mediis eccentri aequantis [illegible]
apsidum, alteram aphelio vicinam, alteram [illegible]
[illegible]entiae ovalis sint in permutata distantiarum [illegible]
[illegible] hujusmodi in longitudinibus mediis, [illegible]
[illegible] alteri prope perihelium, aequales [illegible]
[illegible] etiam diminutio [illegible]
fo[illegible] Experimento [illegible]
circuli [illegible] est 45° 15' [illegible]
[illegible]

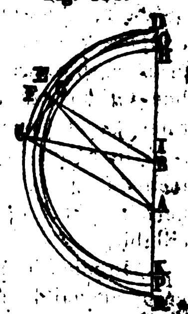
[illegible] 135° coaequata . . . . 127° 0′ [illegible]

[illegible] . . . . 126. 51. [illegible]

Differentia 8. 52

[illegible] intellexi, praesertim ex anomalia 90°, eccentricitatem 9165 [illegible]. Quam correxi secundum methodum capite praecedente [illegible] ut quia in longitudinibus mediis plus indigemus per 3′ 50″ [illegible], dimidium igitur 1′ 55″ datur parti opticae, residuum [illegible] 9165 subtendat 5° 15′ 30″, tu sume 5° 17′ 25″, qui [illegible]. Itaque nova eccentricitate 9230 (quae parum abest a 9264 [illegible] inveni, nec multo longius a 9282, quod est dimidium [illegible] cap. XVI.) universum hunc laborem reiteravi. [illegible] GA vel CA fuerunt exstructae ad [illegible] integros anomaliae distantiariae coaequatae [illegible] ad mediae anomaliae distantiariae [illegible] GD vel GBD. Tertio binae proximae [illegible] GA, AD. Quarto iis divisoribus [illegible] summa 358° 28′ 30″, longitudo scilicet [illegible] sigillatim invicem fuerunt additi arcus [illegible]. Sexto ex priori frustranea operatione [illegible] amplificationes opticae, quod viderem illas [illegible] parum admodum discrepare. Itaque et [illegible] additae ad superiorum summam. Septimo [illegible] summis amplificationum opticarum. [illegible] angulo CBD ad centrum eccen- [illegible] A seu latere opposito, et eccentricitate AB [illegible] angulos 180° aequationis opticae ACB, unde totae [illegible] coaequatae prodierunt. Prodiit autem ad anomaliam [illegible]

Fig. 101.



[illegible] coaequata	quae [illegible] vicaria	Differentia
[illegible] 2′ 24″	23[illegible] 4′ 54″	2′ [illegible]
[illegible] 26. 49	79. 27. 41	0. 52
[illegible] 56. 25	126. 52. 0	4. 25

[illegible] potest augeri, et planeta superius ab [illegible] justo, versus perihelium [illegible]; quare circa [illegible] ut et prius cap. XLVII. Nimium igitur [illegible] satis multae aut non satis [illegible]. Sed haec [illegible] consideratio suo loco [illegible]

[illegible] aequationes [illegible] et [illegible] causae physicae [illegible] in [illegible]

[illegible]

hoc [illegible] constiterit, methodum deinde [illegible] areolas inter rectam [illegible]ED et curvam C [illegible] dixi circello eccentricitatis (duae enim [illegible] areola jam ponitur dupla ad unam lunulam), sed [illegible] ad quamcunque datam longitudinem partium [illegible] planum inter CD et [illegible]B comparetur.

Rursum autem, ut prius cap. XLVI, quia nobi[illegible] patet liber exitus, paciscemur cum [illegible] et [illegible] c[illegible] XLV. nata opinio, quae nos in has difficultates [illegible]

Resumatur itaque schema 98. Quodsi planum [illegible] *perfecta esset ellipsis, descripta ellipsi* δελ [illegible] *communi longiori diametro* δλ, [illegible] *latere longioris diametri divisis p*[illegible]*BC ordinatim* [illegible] *perpendicul*[illegible] *ad longiorem diametrum* δλ [illegible] [illegible] *circuli* BεC [illegible] *demonstrant conici auctores, et Archimedes* [illegible] [illegible] *Tunc igitur ne quidem opus* [illegible] *Pro plano enim ellipsis* [illegible] *circuli* [illegible] *partes circuli adhib*[illegible] [illegible] *Esto* δελ *ellipsis* [illegible] *punctorum ellipsis, puta* ε [illegible] *et continuetur* [illegible] *Quia ergo ut* [illegible]

[illegible]

[illegible] *dat* 463200000 *aream* $\theta\beta\alpha$. *Summa areae* 8317181[illegible]0, [illegible] *superat* [illegible]. [illegible] *anomaliam eccentri esse* 90°. *Et quia* [illegible] *lunulae apud* θ *scilicet* θD *erit* 858: *quare* [illegible] Dβ *erit* 99142, *quae sic se habet ad* 100000, *ut* [illegible] *tangit* 5° 20′ 18″ *angulum* αDβ, [illegible] 84° 39′ 42″, *quam exhibet* [illegible] *hypothesis* 84° [illegible],

[illegible] obiter, quia eccentricitatis inquisitio cap. XLII. niti[illegible] aphelii et periheliis, et in his minimum aliquid errari possit, [illegible] eccentricitatis constitutione excrescit in [illegible]; ideoque, si in[illegible] absolutissima ratio aequandi per causas physicas, posset [illegible] verissima eccentricitas et per eam corrigi omnimode [illegible] aphelii et perihelii. Ut quia hic nimis magna fit ae[illegible]″ (si modo et vicariae [illegible] de plan[illegible] longitudinis [illegible], et [illegible] cap. XLV. assumta vera ponimus); pars [illegible] aequationis causa in longitudinibus me[illegible] [illegible] 1′ 10″ subtraheretur angulo ultimo [illegible] 8″, que[illegible] 9310 tangens; prius [illegible] 4, ecce[illegible] relinqueret 9230 cor[illegible] Sed [illegible] jam [illegible] sequemur, quia assumta in [illegible] monuisse in futuros [illegible] capitum proxime se[illegible]

[illegible] quid in octavis temporum pol[illegible] [illegible] Sit, ut cap. XLIII. anomalia [illegible]

[illegible] 79[illegible] [illegible] 49108[illegible] [illegible] $\beta\alpha$ [illegible] [illegible] 000000, sic C [illegible] hypothesis [illegible]

[illegible]

Anomaliae mediae coaequatae.	Per simplicem eccentricitatem.	Per bisectionem eccentricitatis et duplicationem aequationis partis superioris.	Per bisectionem eccentricitatis et stabile punctum aequatorium, more Ptolemaico.	[illegible]
	respondent	coaequatae	anomaliae	[illegible]
[illegible] 45′ 12″	41° 40′ 14″	40° 45′ 52″	41° 15′ 31″	41° [illegible]
[illegible]. [illegible]. 28	84. 40. 44	84. [illegible]. 48	84. 41. 22	84. [illegible]
138. 45. 12	130. 40. 46	131. [illegible]. 0	131. 15. 31	131. 7. [illegible]
		Excessus et defectus in contrarium vergunt, si duplicetur pars inferior.		
	Cap. XX. et XXIX.	Cap. XXIX.	Cap. XIX.	Cap. XVI [illegible]

Duarum igitur physicarum hypothe[illegible] [illegible] illa exhibet aequationes veritati pr[illegible] distantias veriores dederat, posterior [illegible] levi augmentatione eccent[illegible] aequip[illegible] bile punctum aequatorium, [illegible] ecce[illegible]

Et cum hanc Ptolemaicam supra [illegible] illam physicam, quae [illegible] hac in effectu [illegible] deflectere. Tardus quippe fit planeta circa [illegible] longitudines medias. Quod primum est [illegible] [illegible] esse opinionem cap. XLV, [illegible]

[illegible]

[illegible] non erat exquisita mensura summae distantiarum, [illegible] distantias ipsas computavi singularum circumferentiae partium [illegible]. Secundo, quia proportio non manebat eadem, [illegible] proportionum terminis, igitur singulas singularum di[illegible] ad suos arcus minimos consului seorsim. Tertio, [illegible] distantiarum cap. XLVI. non potuit constitui geometrice, [illegible] arithmetice, nihil enim impediebat. Quarto, hoc mihi [illegible] negotium cum sectoribus sive circuli sive ovalis: itaque [illegible] obstare potuit, quod illi sectores inter se differrent [illegible] in id incubui, ut scirem vel tandem, an ex [illegible] distantiarum hypothesi (nimirum ex opinione cap. XLV.) [illegible] aequationes per vicariam nobis manifestatae.

[illegible] aggressus. Centro B, diastemate BD, scribatur circulus [illegible] apsidum DR, et A [illegible] virtutis, [illegible]. Sumatur in circulo D[illegible] punctum G, [illegible] B [illegible] A, et sit initio GBD angulus [illegible] computandae distantiae. Erit propterea [illegible] A, quamvis planeta ex D [illegible] haec [illegible] computandi [illegible] XLV. in [illegible] DG pars circuli [illegible] ut [illegible] distantiae AG [illegible] ad [illegible] D et G hoc modo compu[illegible] cap. XXIX, collegi igitur [illegible] longissima additione [illegible] 36075562 (eccentricitate [illegible]) [illegible]



[illegible]

Sic igitur data longitudine DC prioris schematis [illegible] DG et distantiae GA, hoc est CA, [illegible] angulum CAD anomaliae coaequatae. Connectatur [illegible] tur AC in E, ubi secet circulum, BC vero in [illegible] igitur scire longitudinem DC, oportuit etiam invest[illegible] Nam quia CD brevior est quam FD, non [illegible] hoc est CBD. Et vicissim, etsi CD brevior est [illegible] ex B apparet, si fingas oculum in B, quanta FD [illegible] Et quia (secundum demonstrata cap. XXXII) [illegible] subtilitatem, quod quanto a B remotior est FD [illegible] sit FD quam CD; quia etiam verum est, ad eandem [illegible] gotii quantumvis acutissimam subtilitatem, quod [illegible] longior quidem in rei veritate est CE quam [illegible] Eucl. III, 7); ergo possum primo, quod CD et FD [illegible] sit mensura anguli CBD, [illegible] est FBD vel [illegible] insensibilis esset. Dabatur igitur angulus [illegible] triangulo igitur ERA ex angulo ERA et [illegible] tudinem AE, unde subtr[illegible] AC vel AG [illegible] CE vel CF appropinquatio [illegible] igitur CE (nam hoc [illegible] licet) [illegible] ad B, si aequabiliter [illegible] punctis [illegible] vero et parallaxis [illegible] seu visibilis [illegible] angulus CBD jam [illegible] qui prius [illegible] numeris [illegible] errore. Dato igitur jam [illegible] complemento ipsius CBA, [illegible] anomalia coaequata CAD [illegible]

[illegible] HK, tangens priorem in K. Manifestum est, circulum [illegible] quam DK, et circulum DGR majorem esse quam [illegible] circumferentiae sunt ad invicem ut earum semidiametri [illegible] BI et BH, sic circulus major DG ad minores BK et KH. [illegible] arithmeticum inter DB et HB, quia BI est dimidium [illegible] circulus DK, tangens minorem et majorem in eodem [illegible], est medium arithmeticum inter illos circulos, quos [illegible] continuetur, ex supposito tangat et ipsa majorem [illegible] D et perihelio B, minorem vero HK in longitudinibus [illegible] major minori HK, minor majori circulo DR. Consentaneum [illegible] non longe abesse ovalem circumferentiam a longitudine [illegible] DK.

[illegible] credere facit haec demonstratio. Sumatur medium [illegible] BH et BD, quod sit BO, et centro B, [illegible] OP circulus. Itaque [illegible] V. Sphae[illegible] planities hujus circuli OP erit aequalis [illegible] est longior semidiameter BD, bre[illegible] isoperimetron capacissima est [illegible] (per [illegible] notitiam) aeque [illegible] circuli. Cum [illegible] semidiametros DH, BH, et cir[illegible] aeque capaces ex jam [illegible] est longior, quam circumferentia [illegible] BO insensibili minor quam TD, eo [illegible] ponitur esse geometricum [illegible] arithmeticum. Per doctrinam enim [illegible] medium proportionale inter HB, [illegible] sic HO [illegible] [illegible]

Fig. 101.



(quod est complementum ad 142° 16′ [illegible]) tantundem itineris absolvet, quantum [illegible] 37° 51′, quod est complementum ad 142° 9′, scilicet [illegible] complementum nempe ad 135°. [illegible]

Interim parum abest, quin haec falsa hypothesis [illegible] prodat: differentia utrinque post correctionem [illegible] Itaque vides, non esse fidendum effectui. [illegible] cap. XLVII, veritatem inter hos duos modos (quorum [illegible] lum, ille ovalem ex opinione cap. XLV. describit) [illegible] vel jam ut et supra cap. XLVII. colligere potes, [illegible] modo latitudinis ejus, quae sequitur ex opinione cap. [illegible] culo resecandas. [illegible]

Modus tertius, et quartus [illegible]

Cum itaque nec haec cum ratione staret [illegible] didicissem, exquirendas distantias respondentes [illegible] seu aequalibus arcubus eccentri CD: accessi et [illegible]

Quinto igitur (adnumero tibi tantum illas operationes [illegible] 180 vicibus perficiuntur) distantias prius inventas [illegible] pularis*) seu inaequalibus CBD ad anomaliam [illegible] tegrorum graduum reduxi proportionaliter. [illegible] modo primo, CBD mansit anomalia; sed [illegible] reductionem anomalia eccentri; ut et modo [illegible]

Sexto iisdem distantiis ut prius [illegible] scilicet sic se haberent ad distantias [illegible] Sed non erat necesse. Volui tamen in [illegible]

Septimo et octavo rursum [illegible] [illegible]

[illegible] erant quam ipsae distantiae, tanto fere jam plures di-[illegible] quam ante. Vide antem et effectum hujus calculi accuri-[illegible]

[illegible]	[illegible] proditur coaequata	In vicaria vero	Differentia	
[illegible]	41° 31′ 0″	41° 17′ 6″	14′ +	Pene coincidit cum praecedente.
[illegible]	84. 45. 50	84. 37. 45	8 +	
[illegible]	131. 1. 52	131. 7. 13	5 —	

[illegible] justo minor arguitur. De cetero errores iidem qui in [illegible]denti. Nam quod signa excessuum signis defectuum per-[illegible] hic differentia ostendit errores anomaliae coaequatae, illic [illegible]. Atque hic est modus tertius.

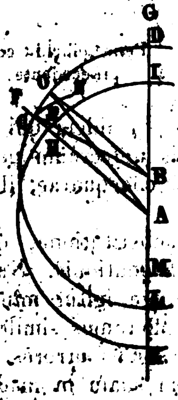
[illegible] AG, AF pro distantiis AD, AC substitutione, qui [illegible], facturi sumus pro duabus tres partes aequationis. Nam [illegible] distantiarum CA, DA summam. Longe igitur minus [illegible] GA linearum summa. Ac etsi medicinam afferamus similem [illegible] modo fuit adhibita: tamen duplicaturi sumus errores.*) [illegible] distantiae tolerari nequeant, ob nimiam suam in medio [illegible] erunt tolerabiles proportionales, utpote longiores. Et si [illegible] effectu calculi, invenies, anomaliae mediae 53° 23′ 58″ [illegible] 46° 0′, quae in vicaria proditur tantum 45° 27′ [illegible] 33″, plane absurda.

Modus quintus et sextus.

[illegible] his modis nihil effecissem, tunc cum anomalia [illegible] illi assignatis (operatione quinta) transivi in tabulam [illegible] cap. XVI, et anomaliae vere coaequatae. [illegible] distantiae AF in gradus integros anomaliae mediae [illegible] competentes competebant etiam in gradus et minutias [illegible] CAH, quae in tabula dicta respondebat ipsi mediae [illegible] reduxi has distantias a coaequatis anomaliis [illegible] vicariae cap. XVI, nempe ab ipsis [illegible] gradus singulos [illegible], hoc est partes aequales. [illegible]

Quod igitur attinet quintum modum et distan... ratio rursum reclamat methodo aequationum huic ... hujus capitis proprium, et revocentur in memoriam, ...

Fig. 104.



prime. In illo enim CAD anomal... quata dividebatur in gradus aequales... CD secaretur in partes inaequales... distantias paucas, unde acc... erroris arrepta, ex summa distantiarum... distantiis illis competere breviorem... in AE transferretur, et sic ED in ... et quolibet gradu sui una distantia... posset. Hic vero non ex summa d... inventarum, sed ex commixtione ... cum hypothesi distantiarum ... facta est perfecta, est translata ... anomaliae mediae*) (quam ... inveniendam in CD arcu ... ED, sic tamen, ut BE et AG ... paralleli ut modo primo. ... commixtionem hypotheseon, nihil opus est ... modo primo. Sed hoc solum quaeritur, an distantiae ... quinto modo collectae in unam summam, efficiant ... sice, quam commixtis duabus hypothesibus ...

Ubi perpende, quomodo se habeant distantiae ... modatae. Angulus igitur EAD, cujus ... hic angulum in aequales gradus ... ... distantia ... angulo EAD, ... in partes inaequales ...

[illegible] currente rota cur urceus exit? Hoc enim quaerebam, [illegible] quae sunt in gradibus aequalibus ED, conjectae in [illegible] anomaliam mediam DC. At operatio respondit mihi [illegible] DC.

[illegible] sextum *) et proportionales convertantur, quae [illegible] demonstrationem cap. XXXII. Etenim arcuum, qui ex centro [illegible] aequales, quantitates verae in orbita sunt in proportione [illegible] AE longior, tanto et ED. At vero aequalium in [illegible] morae sunt itidem in proportione distantiarum. Quanto [illegible] distat ab A, tanto et diutius versatur planeta in arcu [illegible] quas nectit planeta in illis arcubus, qui ex centro Solis [illegible] sunt in dupla proportione distantiarum. At sic etiam [illegible] in dupla est proportione ipsius AC vel AE distantiae [illegible] itaque morarum, quas nectit planeta in gradibus anguli [illegible] sunt lineae AG, AF proportionales competentes [illegible] anomaliae vere coaequatae gradibus integris seu par- [illegible]

[illegible] ergo sic proportionales distantiarum ad aequales gradus [illegible] ut supra hoc capite probatae sunt aliae etiam di- [illegible] 25092048, summa distantiarum omnium 360 ad binas [illegible] Solem aequales, valet moram 360°, quid valet summa [illegible] quolibet gradus anomaliae coaequatae?

Hoc pacto invenitur:

[illegible] anomaliae	[illegible] prodit	Differentia	
[illegible] 24′ [illegible]″	48° 19′ 2″	5′ +	
[illegible]	91. 34. 8	3′ —	Coincidit cum illis capitis XXIX.
[illegible] 28. 10	101. 34. 7	6 —	
[illegible] 28. 5	188. 39. 28	11 —	

[illegible] eccentricitas minor justo: qua emendata, differentia [illegible] circiter 8′ +, infra circiter 7½′ —, ut hic quoque apud [illegible] velox fiat, itaque plus justo distantiarum sit circa [illegible] justo in longitudinibus mediis. Sed propinque ad- [illegible] et cum methodo cap. XLIX. plane coincidit. [illegible] XLIX. illic partem aequationis [illegible] partem physicam itidem seorsim; hic vero [illegible] Illic lectiones radios virtuosos introduximus, [illegible]

[illegible]

opinio cap. XLV, etsi tandem sumsimus distantias [illegible] parte temporis, quot sunt gradus anomaliae [illegible] derivatae sunt ex distantiis anomaliae mediae, [illegible] eaedem. *) Et tanto commodior est haec forma, [illegible] nem de motu planetae epicyclico hic possumus [illegible] ad veritatem causae physicae propius accedere, [illegible] nisi librationem in diametro, sed quae etiamnum [illegible] aequationibus his apparuit. Nam ut paulo ante ad [illegible] adnotatam, haec praeoccupatio motus epicyclici nimis [illegible] nimis breves in longitudinibus mediis; ex quo fit, ut [illegible] excedat velocitatis, et in apsidibus a modo deficiat, [illegible] cule exprimere opinionem cap. XLV. Quare etiam [illegible] cap. XXXII, non posse constantem esse hanc [illegible] quod partes eccentri, vicinae apsidibus, directe ob[illegible] ex oblique, ut ita aliter appareant, quam si directe [illegible] quam, si quis objiciat, respondebo sic, ut cap. XLIX [illegible] mediarum partium obliquitatem addi a planeta de suo [illegible] sunt; non igitur imputandum causae motrici ex Sole [illegible]

Habes igitur studiose lector ex tanto numero [illegible] methodos aequandi cum opinione cap. XLV. [illegible] terum hypothesi physica cum epicyclo [illegible] eamque cap. XLIX; alteram hoc capite [illegible] physica sinceriori; ubi epicyclus nihil nisi [illegible] aut si quis illum vellet in latitudinem [illegible] Et harum utraque diversis viis [illegible] fidere poteris in examinanda opinione capitis [illegible]

Et hactenus inani fiducia inventis [illegible] de [illegible] triumphatum esto. Nunc [illegible] tumultus novosque labores excitat.

[illegible] Foris vero speculatores per totum eccentricum [illegible] distantiae inquam genuinae, profligarunt [illegible] cap. XLV. accersitas copias, earumque jugum excusserunt [illegible] parum abfuit, quin hostis fugitivus [illegible] meque in desperationem adigeret: nisi [illegible] subsidiis, fusis et palantibus veteribus, submissis [illegible] proripuisset, omni diligentia edoctus, vestigiis ipsius [illegible] inhaesissem. Utramque rem, ut gesta est ordine, [illegible] capitibus.

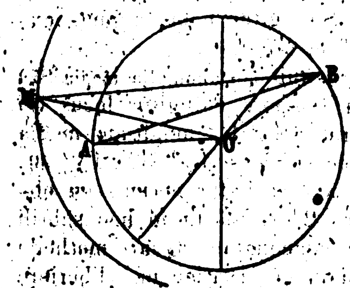
[illegible] primo dicam initio, prius plurium eccentri locorum di- [illegible] sit plenior fides rei. Sit igitur nobis animus ex- [illegible] circa anomaliam mediam 90° et 270°.

[illegible] Maji h. 11 $^{1}/_{2}$ ♂ observatus fuit (in anomalia media 87) [illegible] cum lat. 0° 6 $^{2}/_{3}$′ bor., quo tempore colligitur locus ☉ [illegible] ejusque distantia a Terra 101361, longitudo media [illegible] 36″, ac propterea locus eccentricus 15° 32′ 13″ ♏. [illegible] vicaria cap. XVI. non assequebatur verum seu ob- [illegible] in situ acronychio intra 2 $^{1}/_{2}$′, ut ita in hoc subtili [illegible] compulationi anomaliae coaequatae. Quare methodo [illegible] vel XLII. adjungam aliam observationem, liberiore [illegible] Verum ut supra quoque cap. XII. monui, non saepius bis [illegible] Duabus igitur observationibus [illegible] huic jam positae altera ex anno 1594 [illegible] h. 7 $^{1}/_{2}$ colligitur longitudo media ♂ 7s 26° 13′ 20″ [illegible] Tunc itaque Mars in altitudine 8° [illegible] Virginis 50° 34′ distare. Cum igitur [illegible] igitur inter Spicam, ejus locum eclipticum [illegible] 50° 34′, et latus inter Spicam et eclipticam 1° 59′ [illegible] Ergo latus reliquum est 50° 32′ 18″. Quare cum [illegible] inciderit in 8° 48′ 18″ [illegible] qui locus declinat [illegible] declinaret 21° [illegible] Ergo [illegible] latitudinem, scilicet 9′ 20″ [illegible] borealem latitudinem 18′ [illegible] fuit Mars prope Solem [illegible]

[illegible]

2′ 30″. Erit igitur et in posteriore nostra observatione [illegible]
parallaxe minor, quod 8′ simus nodo propiores. [illegible]
2′ 30″, cum hic angulus ad ☉ sit 61°, ad Terram [illegible]
latitudinem 1′ 50″ sept. circiter; indice nostra [illegible]
usurpatione refractionis fixarum latitudo nobis [illegible]
Solaris vero usurpatione redigebamur per 6′ 33″ [illegible]
juste plus fuit in nostra refractione suscepta, [illegible]
quae refractio justa fuerit, scilicet 3′ 36″. [illegible]

Fig. 105.



in 8° 46½′ ♐. [illegible]
orbitae Telluris. A [illegible]
observatione, B in [illegible]
nectantur lineae [illegible]
praecise redierit in [illegible]
tamen situ repraesent[illegible]
igitur AMO 29° [illegible]
Assumatur MO [illegible]
hic quaeritur) [illegible]
Cadat igitur OM in 1[illegible]
si OM in [illegible]
assumta, in [illegible]
Unus quidem [illegible]
mutat distantiam 240 particulis, qualicunque [illegible]
nitia. Ergo cum hic differant longitudines [illegible]
praecessionis tantum 8; pars proportionalis [illegible]
secunda observatione assumimus OM 151 [illegible]
38° 9′ 40″, et OB est 98232. Ergo datum [illegible]
secunda vice in 15° 40′ 9″ ♏, differentia [illegible]
Debuit differre paulo amplius. Nam [illegible]
quibus in eccentri [illegible]
ad praecessionem aequinoctiorum [illegible]
12′ 37″, debuit igitur in 15° 43′ 40″ ♏ [illegible]
[illegible]

[illegible] aliqua fuit, essent intenti. Anni vero 1593 [illegible] [illegible] esset in quadrato Solis, observatio non ultra hunc [illegible] [illegible], quia ad hanc quadraturam praecipue solent [illegible] [illegible] anni 1595. d. 17. Dec. vesperi h. 7, 6′ visus est planeta [illegible] ♉, cum lat. 1° 40′ 44″ bor. Locus Solis fuit 5° 39′ 3″ ♑. [illegible] Terra 98200. Colligitur autem longitudo media Martis [illegible] quia aphelium 4ˢ 28° 58′ 10″, ideo distantia loci ab [illegible]° 53′ 48″. Prius pene erat eadem porro, nempe 87° 9′ 24″. [illegible] pene absunt aequaliter ab aphelio. Respondet autem [illegible] simplici ex vicaria nostra hypothesi anomalia coaequata [illegible] quae ablata a loco aphelii relinquit 12° 32′ 22″ ♊, locum [illegible]. Sit A (Fig. 106) *Terra*, O *Sol*, M *Mars*. *Datur* AO [illegible] OM *in* 12° 32′ 22″ ♊, AM *vero in* 11° 31′ 27″ ♉, [illegible] 0′ 55″. *Et quia* AO *in* 5° 39′ 3″ ♑, *sed* AM *in* [illegible] *ergo complementum* OAM 54° 7′ 36″. *Hinc, quia ut* [illegible] AO, *sic sinus* OAM *ad* OM, *prodit* OM 154432. Et [illegible] 15′ est apogaeo propior, quam ille anno 1589: et hoc [illegible] 240 particulas: itaque 60 particulae pro 15′ adi- [illegible] distantiae ab aphelio in locis remotioribus sunt breviores, [illegible] 154372. Vicissim, quia nodus est circa 16° 20′ ♉, locus [illegible] 12° 32′ ♊, distat igitur a nodo 26° 12′ et inclinatio [illegible] est 1° 50′. Ergo inclinatio hujus loci est 48′ 32″, [illegible] radium particulis 10, quae sunt in nostra dimensione [illegible] ipsius puncti in orbita Martis a Sole est 154387. [illegible] distantia ab aphelio inveniebatur distare a Sole [illegible] ergo ad eundem aequales sunt horum punctorum eccen- [illegible]. Nam quae in posteriori desiderantur 13 particulae, [illegible], si intra 100 particularum incertitudinem [illegible]

[illegible] non tam ad confirmanda priora, quam [illegible] ut lectori occasionem praebeam, observationes [illegible] observationibus comparandi, quo medio tandem in- [illegible] beneficio vir ille affecerit. Exstant [illegible] ejusdem [illegible] Octobris anni 159[illegible], [illegible] radio capta in [illegible] revocata per ipsum [illegible], qui noverat [illegible]

[illegible]

advenabimus in consilium: sufficit enim nobis [illegible]
ponitur autem longitudo media Martis ad [illegible]
babilem, cum horam non adscripserim [illegible]
eccentricus in 9° 43′ II, distans a nodo per [illegible]
43′ 52″. Sol vero in 15° 40′ ♏, et Martis locus [illegible]
citer 12½° ♋. Quare latitudo 1° 36′ 24″ [illegible]
longitudo puncti in linea ex duodecima in quartam [illegible]
1° 30½′ bor. Cum igitur sit quarta in [illegible]
duodecima in 12° 56′ ♋, lat. 0° 13½′ austr. [illegible]
tudo proportionaliter 12° 16′ 17″ ♋. Mars [illegible]
29. Oct. et die 30 jam transierat. Diurnus [illegible]
dimidium 2½′, ut die 30. mane fuerit in 12° [illegible]
1600 completo; sed ut anno 1597 in 12° 16′ [illegible]
in latitudine vix unum queunt efficere in longitudine [illegible]
est locus. Si etiam per primam et quintam [illegible]
cujus latitudo sit 1° 30½′, cadit in 12° [illegible]
talior. Haec est magis in consequentia, scilicet [illegible]
gula ante, intermedius etiam. Quare latitudo [illegible]
putata; debet enim et ipsa proxima esse [illegible]
inter 1° 30½′ Martiam et quintae 5° 42′ [illegible]
et primae 10° 2′ interest 4° 20′ media [illegible]

Sit igitur Mars in 12° 16′ ♋. Anno [illegible]
invenitur locus Solis 16° 38′ 8″ [illegible] Distantia [illegible]
1° 29′ 42′ 10″. Aphelium [illegible] 28° [illegible]
mentum 90° 15′; coaequatae 78° [illegible]
Quare hinc elicitur distantia 154753 in [illegible]
quinam ab aphelio [illegible]
[illegible] debitam 240 + 360 [illegible]
particulas, ut pro linea in plano ecliptico [illegible]
Martis. [illegible] 154272 [illegible] 154400 [illegible]
[illegible]

[illegible] angulus ad [illegible] 0", [illegible] 10". Quare hic prodit distantia ♂ a ☉ [illegible] [illegible] etiam propior [illegible] aphelio per 1° 26' 30" [illegible] gradui particulae circiter 229 [illegible] [illegible] gradiumque particulae 317: sic ut hic locus, si ad [illegible] cum superiori referatur, habeat distantiam [illegible] [illegible] Unde arguitur, junctas has binas observationes metho[illegible] tradita tractatas locum eccentricum [illegible] [illegible], cum tamen ob vicinitatem 17° ♍ in periculo [illegible] atque alterius scrupuli. Adde, quod in posteriori [illegible] Aquila prodatur 54° 12', quod cum ceteris observatio[illegible] 12' non consentit, itaque haec observatio non [illegible] [illegible] Addendum autem etiam exiguum aliquid ob latitudinem [illegible] alterius semicirculi occurrit apta observatio anno [illegible] h. 6¾, cum esset locus ☉ 29° 35' 1[illegible]" ♍ [illegible] longitudo media ♂ 2s 15° 10' 20", aphelium 4s 28° 44' 20" [illegible] anomaliae mediae 73° 34' et coaequatae [illegible] 18". [illegible] 24° 59' 2" ♊. Tunc, inquam, observatus est pla[illegible] ut fuerit angulus visionis seu ad Terram 57° 0' 18" [illegible] 26' [illegible]". Quibus elementis conficitur distantia [illegible] Et quia prius Anomalia fuit 70° 55', jam 73° 34' [illegible] per 2° 39', quibus in proportione prius indicata [illegible] Itaque ex analogia hujus observationis [illegible] [illegible] superiori 158217, ubi [illegible] ob latitudinem [illegible] est addendum quam primo. Differentia 427 [illegible] incertitudine observationum [illegible] [illegible] contemnenda [illegible] 1000 [illegible] 3000 [illegible]

[illegible]

nos 1° 27′ ad analogiam priorum. Itaque Mars videt [illegible]
prius. Quare angulus ad Terram 73° 27′ 27″ [illegible]
Quare hic distantia Martis a Sole 163051, exc[illegible]
quae levissima mutatione loci eccentrici absorbe[illegible]
non est usque ad 1′ fidelis. Sed et in applicatione [illegible]
vitaitum aliquid facile potuit. [illegible]

Pro longitudine consimili in semicirculo altero [illegible]
cap. XXVII, ubi exstruxi distantiam paulo minorem [illegible]
aphaeresi observationum, ex paris observationibus [illegible]
ut prius, in plano eclipticae. Est autem in una [illegible]
gaterum, scilicet anno 1589. d. 11 Feb. [illegible]
6s 12° 38′ 44″, aphelium 4s 28° 59′ 57″, anomalia [illegible]
humilior quam prior nostra per 24′, quibus [illegible]
64 particulae circiter. Itaque distantia, quae [illegible]
minor quam 163137, ex hac analogia in anomalia [illegible]
ut sit quam proxime 163100 in hoc semicirculo [illegible]
vel 162996, rursum impraestabili propinquitate [illegible]

Notandum autem, quod cap. XXVII [illegible]
cogerunt adimere loco eccentrici ex vicaria [illegible]
5½° [illegible] idque per observationes annorum [illegible]
[illegible] Idem testabatur supra cap. XVIII [illegible]
in [illegible] adimenda scilicet esse vicariae [illegible]
26″ [illegible] adhuc adimendum erat [illegible]
[illegible] observationes annorum 1589 [illegible]
Vicaria nostra computata scrupula 3¼ [illegible]
longitudinem mediam hujus semicirculi. [illegible]

Similiter [illegible] aphelium [illegible]
in anomalia media 11s 37′ inventa est [illegible]
[illegible] 166100 vel 166[illegible]
[illegible]
[illegible] 1589 [illegible]
[illegible] a Terra [illegible]
[illegible]

[illegible] die 6. Nov. mane h. 6. 50', cum esset locus Solis [illegible] distans a Terra 98630; Martis longitudo media [illegible]"; residuum anomaliae 8° 2' 51"; locus eccentricus ex vi[illegible]". Qui visus est ♂ in 28° 16' ♍, lat. 1° 37'. Quare angulus [illegible] 47' 43", ad planetam 31° 8' 12". Et distantia igitur pla[illegible] 166514, sed per subtractionem 1' 30" de loco vicariae, [illegible] analogia in majori distantia ab aphelio, scilicet 11° [illegible] 110; quare vel 166401 vel 166286, ubi discrepantia [illegible] 120 [illegible], si stante correctione loci eccentrici medium harum [illegible] 166330; ut parum aliquid in observando peccatum esse di[illegible] utriusque observationis annorum 1586 et 1588, [illegible] descendentis, differemus parum. Poterit hoc ipsum [illegible] aboleri per retractionem nonnullam aphelii, de qua postea. [illegible] aphelium, quantum sensus judicare potest, easdem [illegible] a Sole, in eadem utriusque semicirculi habitudine ad [illegible]

[illegible] omnes tres observationes factae Marte orientali; nulla [illegible] deficiunt enim observata reliqua. Itaque tutius fortasse [illegible] semicirculi descendentis.

[illegible] quod supra nobis explorandum infra longitudines [illegible]

[illegible] post diem 13. Maji h. 1. 46' post mediam noctem, [illegible] 48" ♊, distantia a Terra 101487; Martis vero longi[illegible] 4"; anomalia 113° 24' 4"; coaequata 109° 15' 48"; [illegible] vicaria 12° 6' 48" ♐ (vel per analogiam vicina [illegible] 12° 8' [illegible]). Visus est Mars in 2° 24' [illegible] angulus igitur ad Terram 20° [illegible] 44" [illegible] [illegible] 14' 39" vel 20° 15' 42". Quare distantia [illegible] Sole 147[illegible]2 vel [illegible] 147[illegible], ubi vides unius [illegible] 120 particulas nostrae di[illegible] propinquitate, tantaque [illegible] op[illegible] persequenda. [illegible] bene [illegible] frequentium [illegible], atque [illegible] Sole. [illegible] 12° [illegible] ♐ a [illegible]

[illegible]

[illegible] fluctuare inter 147448 et 147750, [illegible] quae sunt in praesenti negotio non magni moment[illegible] Soli seu centro mundi vicino. [illegible]

Sed et hic profundius versus perihelium [illegible] exploremus 22° circiter ante et post perihelium [illegible]

Anno 1589. d. 3. Dec. h. 5. 30', cum esset locus [illegible] distaretque is a Terra 98248, et longitudo media [illegible] anomaliae complementum 162° 24' 11", et locus [illegible] 29° 4' 32" ♓: visus est Mars in 15° 25' 33" [illegible] Sed quia supra cap. XLII. inventa est vicesia [illegible] perihelium; adsciscemus igitur loca alia, [illegible] quae ex iis methodo capitis XLII. quaeremus [illegible] simul etiam locum eccentricum veriorem. [illegible]

Anno igitur 1591. d. 16. Oct. h. 6. 28' [illegible] distans a Terra 99142, longitudo media [illegible] complementum 165° 0' 9", locus eccentricus ex vic[illegible] visus est in 1° 27' 18" [illegible] lat. 2° 10' 52" [illegible]

Sic anno 1593. d. 8. Sept. h. 10. 38' [illegible] distans a Terra 100266, longitudo [illegible] complementum 161° 45' 28", et locus [illegible] inventus est planeta in 8° 53' 31" ♓, lat. 5° [illegible]

Denique anno 1595. d. 22. Julii [illegible] 7° 52' 52" [illegible] distans a Terra 101487, [illegible] complementum 164° 42' 55", [illegible] 15° 16' 26" ♓: inventus est [illegible] in 1° 11' 10" [illegible] lat. 3° 30' [illegible]

[illegible]

[illegible] hic primus et tertius locus admodum prope consentiant, [illegible] aliquis, standum ab illis, ceteros utcunque conciliare. [illegible] quoque diu admodum tentavi. Sed cum conciliari non [illegible] et quartus, esset vero magna vis harum observationum, quod in quadrato Solis utriusque visus sit planeta, et in quadri[illegible] omnia prope latera angulique aequales sint, ideo sic transegi. [illegible] distare debere AK secundae observationis ab AK quartae, [illegible] per hanc assumtionem longitudinis AK distant per 30′ 55″, [illegible] per 13′ 33″. Cumque omnes anguli quadrilateri sint prope[illegible], bipartitus sum excessum hunc, et 6′ 46″ addidi ad [illegible] GKA. Nam in E observatione linea AK nimium processerat, [illegible] processerat. Retractis ergo AK versus E, G, et EK, GK [illegible] enim observationes esse certissimas) omnino anguli [illegible]. Jam igitur datis angulis GKA 45° 35′ 13″ et EKA [illegible] et manentibus angulis G, E et lineis GA, EA, prodiit AK [illegible] differens 258 particulis a nostra assumtione. Totidem [illegible] et de reliquis duabus AK, et sint 138934, 139000, [illegible] EKA 34° 43′ 47″ et AK 20° 9′ 40″; FKA vero 12° 1′ 24″ [illegible] Sed quia prius in G addidi 6′ 46″, et in E tantum [illegible] ergo locos eccentricos in G 17° 2′ 31″ ♓, E [illegible] locum vicariae per 3′ 17″. Tantundem ergo de[illegible] scilicet . . . . 20° 7′ 49″ ♓

[illegible] ♓ Hic vero inveni 20. 9. 40

Differentia 1. 51 plus.

[illegible] minus.

[illegible] duos locos sat propinque adduxi. Nam peccatis [illegible] quod facit ad securitatem. Et duorum [illegible] zodiaci humilitatem et variationes horizontales [illegible] insolens.

[illegible] consimili anomalia non suppetunt plures una [illegible] certa. Anno enim 1593 nocte quae [illegible] cum ☉ esset in 17° 25′ 42″ ♉, [illegible] 3 10° 10′ 7′ 29″, anomalia 161° 5′ 29″, [illegible] 4° 37′ [illegible] 56° 12′ 42″, ad [illegible] Unde [illegible] anomalia 161° 45′ [illegible] Nam [illegible]

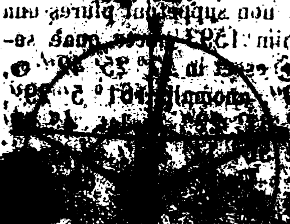
Quae igitur ex hujus capitis observationibus ... distantiis in conformationem itineris planetarii reducendis ... produximus hoc capite, ea differemus in caput LV. ... sequenti cap. LII. ex his aliud aliquid demonstr... plures adhuc observationes in testimonium adducendae ...

Caput LII.

Demonstratio per observationes capitis LI, eccentr... centrum epicycli Solis, seu punctum medii loci Solis, ... corpus Solis ordinari: et lineam apsidum non per ... transire.

Opportune accidit, ut distantiae cap. LI. inventae edoceant, quod cap. VI. XXVI. et XXXIII. promissum ... distuli. Nam si recte ego eccentricum Martis ... exstruxi, necesse est, vere etiam planetam in ... 29° ♌, longissime a Sole abesse: quae vero in ... 29° ♌ aequalibus sequuntur intervallis, aequaliter ab... a puncto Solis vicario, quod Braheo est centrum ... scilicet, quae in semicirculo descendente. Quo ... partes circa 24° ♌ non abesse longissime neque ... centro mundi Copernicano, quod est Braheo cent... centrum affixionis systematis planetarii, et parte... circulo aequali arcu descendentis ... vicario inaequaliter. Exponatur enim centrum ... AC eccentr...

Fig. 107.



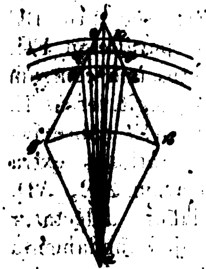
[illegible] ut longiorem BD esse? Respondeo: qualescunque lineae eji- [illegible] manent AE, AD, quia sunt ex observationibus demonstratae [illegible] hypothesium: et ad demonstrationem hanc, quod contro- [illegible], assumtum plane nihil. Manentibus igitur AE, AD, ejiciatur [illegible] oppositum mihi est: illa tamen BC, ut demonstravi cap. VI, [illegible] hypothesin aptam observatis ἀκρονυχίοις; sed pro BC [illegible] salvemus acronychias, ejicere per F ipsi CB parallelon FH, [illegible] aequalitatis Martis et Solis. Hoc autem facto, una centrum [illegible] C in I transfertur, et plus quam semicirculus vergit versus E, [illegible] D: nec relinquuntur AE, AD, sed prolongatur AE, abbrevia- [illegible] lineis mutatis nunquam salvabuntur observationes extra [illegible]: quia hae testantur de aequalitate linearum AE, AD. [illegible] puto computatione. Si quis tamen hoc labore delectatur [illegible] astronomum numeris aliquid tentare, cujus fundamenta [illegible] in geometria, quae jam laboris hujus fundamenta nobis [illegible] exemplum supra cap. XXIV, ubi distantias Telluris ab H, [illegible] motus Telluris, et distantiam Martis ab eodem H puncto [illegible] simul, iisdem observationibus computavi, quibus postea [illegible] ejusdem Telluris et Martis computavi ab A centro [illegible], qua sum usus, ingenium hoc est, ut doceat, quocunque [illegible] Telluris assumto, quod habeat descriptum et deter- [illegible] corpus Solis, tam in longitudine zodiaci, quam in re- [illegible] per aliquot observationes docere et Telluris et Martis ab [illegible] distantiam; citra etiam cognitionem anomaliae eccentri [illegible] accommodatae: qua quidem ego cap. XXVI. [illegible] usus sum.

[illegible] ratione argumentari licet. Demonstratum est [illegible] planetae non esse circulum, sed ovalem, ut [illegible] sit longissima. [illegible] cap. LI. demonstratur, [illegible] aequaliter [illegible] situs est circa lineam AC, [illegible] Martis distantias [illegible] a puncto H me- [illegible]

[illegible]

ne fundamentis neglectis ruinosum superstruatur [illegible] eandem rem, verissimas scilicet Martis a Sole [illegible] explorare. Sit α Sol, β locus Terrae ante opp[illegible]

Fig. 108.



angulus visionis, seu elongatio [illegible] similiter γ locus Terrae post opp[illegible] gulus visionis: sic ut primo tempore [illegible] $\beta\delta$, altero in linea $\gamma\delta$, et [illegible] itaque tempore duarum observation[illegible] $\vartheta\alpha\eta$ sat praecise quocunque loco [illegible] vicaria. Quodsi bina tempora [illegible] distiterint, aut si planeta [illegible] longitudines medias, mediocritas [illegible] rentia longitudinis linearum [illegible] jam habemus in praecognitis, [illegible] relinquatur. Quodsi itaque [illegible] observatione datos, et $\beta\alpha$, $\gamma\alpha$ cognitas ex [illegible] et propterea $\eta\alpha$, patet, si haec assumtio longior [illegible] tunc angulum $\iota\alpha\kappa$ minorem justo proditurum, [illegible] $\zeta\alpha$, $\iota\alpha$, angulum $\epsilon\alpha\zeta$ proditurum justo majorem. [illegible] assumendae, quae justum nobis constituant [illegible]

Eodem modo prodetur hic etiam error, [illegible] eccentrico. Esto enim, ut $\vartheta\alpha$, $\eta\alpha$ teneant justa [illegible] $\vartheta\alpha$ in consequentia, per errorem, angulo [illegible] quantum, angulo aequali [illegible] vides, quod pro [illegible] longa, et pro $\alpha\eta$ successura est [illegible] thesi praecognoscitur. Oportet autem non [illegible] ne error observationis vel minimus [illegible] (qui fieri potest) magnum [illegible] [illegible] per annos 1580 in [illegible] [illegible]

[illegible]

... sic 100000 ad 37687. Qui sinus ostendit angulum γαθ ... si pro ξθ sumtas jam οθ.

... commutationis varietur 22½°, multi dies, ... post quos vel ante quos αθ longe est ... angulus commutationis est 28° circiter, in ...

... gravissimi erroris, si quis oritur ex vitiosa distantia ... inventis, jam facile nobis est, idoneas seligere observationes, ...

... oppositione anni 1582, ... seligemus observa-

		Anno 1583
28. Dec. h. 8. 30'.	30. Dec. h. 8. 10'.	26. Jan. h. 6. 15'.
17° 40′ 30″ ♋	16° 0′ 20″ ♋	8° 28′ 30″ ♋
4. 7. 0. b.	4. 8. 0. b.	2. 32. 12. b.
15. 4. 12. ♑	19. 8. 31. ♑	16. [illegible]. 20. ♒
αθ 96226	αγ 96242	αγ 99624
49. 39. 10	47. 51. 30	34. [illegible]. 15
12. 3. 10. ♋	17. 37. 32. ♋	0. [illegible]. 49. ♌
16. 5. 22. ♋	17. 55. 45. ♋	0. [illegible]. 30. ♌
158062.	αη 158942	αη 164116
163147	158907	164196.

... per 4240. Et quidem brevior est posterior αη, cum ... Summa igitur utriusque 322054. Unde ... Constitutorum dimidia sunt 160859, nimirum ... Eritque αθ in 16° 5′ ♋, et αη in 17° 55′ ♋.

... parvum sibi insidae. Nam ... vitio observandi, quod facile contingit, ... Sumantur igitur duae re- ... praecognoscimus, debere ... ut prius, prodeunt veriores ... 0″ ♋, αη in 0° 8′ 30″ ♌. ... hoc loco adimendum esse locis ... 1½°. Conferantur etiam ... oppositionem, quae pro- ...

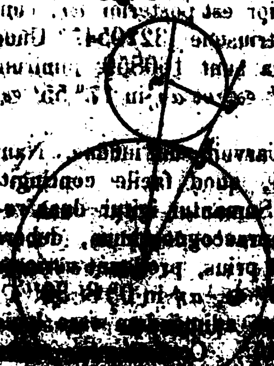
	Anno 1594 d. 21. Dec. h. 14.				Anno 1595 24. Jan. h. [illegible]				[illegible]
Sol in	10.	48.	5	♋	15.	9.	5	♒	[illegible]
Distabat a Terra		98210				98698			
Anomalia media ♂	29.	46.	59		12.	4.	21		[illegible]
Locus eccentricus	3.	54.	24	♌	18.	49.	0.	♌	23. [illegible]
In ecliptica	3.	53.	56	♌	18.	49.	3	♌	23. 35. [illegible]
Hinc αθ		165101				166290			[illegible]
Per latitudinem		165184				166376			[illegible]

Fig. 108.



Differunt duae mediae per [illegible]
187 in contrarium: [illegible]
166412. Ergo $\alpha\theta$ cadit in 18° [illegible]
23° 34′ 48″ ♌. Itaque tam [illegible]
eccentrici confirmatur hoc [illegible]
hinc, quod unius minuti [illegible]
utrinque distantiam 100 [illegible]
Censuitis itaque [illegible]
1022. Debuit esse ex [illegible]
esse major differentia, [illegible]
vicinus est 48° [illegible]
loco eccentrico [illegible]
jam 100 particulis [illegible]
2½′ efficies 164[illegible]
[illegible]
166206 [illegible]
quae longitudinem [illegible]
cum ista possit [illegible]
indica [illegible]

Fig. 109.



[illegible]

Distantiae igitur, methodo capitis hujus [illegible]
positis, prodibunt hae ipsae. Loca vero appar[illegible]
centrico in Cancro versatur, prodibunt circiter [illegible]
totidem promptiora. Neque veniunt hi errores [illegible]
enim essent in contrariis plagis ejusdem, sed contrari[illegible]
illos conciliari posse mutatione apogaei ☉ per [illegible]
Brahei facile licet. Nihil tamen definio in praesens [illegible]
hujus apogaei et totius hypotheseos correctio in opus[illegible]

Caput LIV.

Accuratius examen proportionis [illegible]

Capite XLII. constituimus sane proportionem [illegible]
extra situm acronychium, sed [illegible] non undique [illegible]
mutuo consentientibus. Atque etiam per se [illegible]
tur observationes, negotium hoc ipsum ad [illegible]
adduci nequit. Agendum igitur suffragiis [illegible]
cap. XXVIII. in anomalia media 11° 37', [illegible]
cap. LIII. praecedentis in anomalia 11° [illegible], [illegible]
ecliptici, in quod perpendicularis a corpore [illegible]
166208; cumque locus hic [illegible] a limite [illegible]
circiter, excessus secantis 45 particulae [illegible]
70 circiter. Martis igitur a Sole distantia [illegible]

Jam comparabimus etiam observ[illegible]
[illegible] Anno [illegible] in anomalia [illegible]
correctionem [illegible], invenimus [illegible]

[illegible]

[illegible] cap. LI. ad anomaliae residuum 161° 45½′, hoc est post cor[illegible] invenimus distantiam citra correctionem latitudinis [illegible] autem 139000 in 21° ♓. Qui locus [illegible] 35° [illegible] inclinatio 1° 31½′, erit excessus secantis 35½, quae [illegible] dimensione. Itaque distantia vera Martis a Sole 139049. [illegible] est 100000, distantia perihelia est 575 particulis brevior, [illegible] anomalia 161½°, quae faciunt in nostra dimensione 876 par[illegible] si perfecto circuloutereris. Atque hae sublatae ab 139049, [illegible] perihelia distantia 138173. Differentia 327 ab 138500 [illegible] inventa.

[illegible] hanc igitur methodum invenitur:

Aphelia	. .	166510
Perihelia	.	138173
Diameter	.	304683
Semidiameter		152342
Eccentricitas		14169

[illegible] autem 152342 fit 100000, talium 14169 fit 9301.

[illegible] quia observata nostra, praesertim in perigaeo, tantam dif[illegible] fuerunt; et quia fieri potest, ut vicaria, utpote falsa, aliquid [illegible] in eccentricitatem; priusquam certo concludatur, omnia [illegible] aphelium itaque distantiam hic inventam, puta 166510, [illegible] eccentricitatem cap. XLII, quae fuit 9265. Ut igitur 109265 [illegible] ad 138274, ubi radius est quam proxime 152400. [illegible] multiplex experientia, verissimam eccentricitatem et quae [illegible] convenientissima, esse inter 9230 et 9300; hoc [illegible] cap. XLII, scilicet 9265. Ut igitur neque nimium [illegible] inventam hoc capite, scilicet 138173, neque nimium [illegible] 166510, concludamus, apheliam verissimam esse 166465, [illegible] ubi radius 152350.

Caput LV.

[illegible]

longiores erant in mediis longitudinibus, quam [illegible] quas hypothesis illa efficit, quae ovalem planetae [illegible] fiunt. Ergo patet, viam planetae neque circulum [illegible] circulo ingredi ad latera, quantum ovalis illa, [illegible] et cap. XLVI. descripta, ingreditur, sed media [illegible] usurpatis distantiis cap. XLV, si computaveris [illegible] illa, quae cap. LIII. eminus oppositionem circum[illegible] positionem planeta nimis in consequentia, post oppositionem [illegible] cedentia. Atque id anno 1589 et 1591 in descendente [illegible] anno 1582, 1595 in ascendente, est evidentissimum. [illegible] ovalis ista cap. XLV. 660 particulis in defectu, ut circulus [illegible] peccat in excessu: quae possunt in apparentia efficere [illegible] que et David Fabricius ex suis observatis hypothesin [illegible] quam ipsi pro vera communicaveram, erroris hujus, nimis [illegible] tiarum in mediis longitudinibus, coarguere potuit, ea [illegible] literis, quo ego in inquirenda vera hypothesi [illegible] Adeo parum abfuit, quin ille me in deprehendenda [illegible] (Comp. p. 95). Cumque perfectus circulus [illegible] hinc argumentamur recte, veritatem esse in [illegible]

Atque idem etiam capitibus XLIX. [illegible] causis physicis computatae, lunulam [illegible] resecatur, debere saltem dimidiam habere [illegible] cap. XLV. resecat. Itaque nihil nos impedit [illegible] [illegible] diximus: opinionem scilicet [illegible] circuli resecatur, in contrarium [illegible] cap. XLV. in fumos abiisse. [illegible]

Caput LX.

Demonstratio ex observationibus [illegible] demonstratio esse [illegible]

[illegible] usurpetur radius in longitudine media, [illegible] id, quod [illegible] Et in schemate cap. XL. conclusi [illegible], si [illegible] HR, pro VA vero VR, et [illegible] et sic in omnibus, fiet [illegible] eccentrici, quod hic [illegible] mediis. Et per [illegible] schemate parvo cap. [illegible] vel $\alpha\iota$ sumetur $\alpha\mu$, [illegible] sumetur $\pi\rho$.

[illegible] lector percurrat caput [illegible] jam antea ex natura[illegible] esse, quod hic obser[illegible], consentaneum scilicet [illegible] diametro quasi epicycli, [illegible] Solem tendat, librationem [illegible]. Inveniet etiam, nihil magis [illegible] pugnasse quam hoc, quod [illegible] repraesentandum per[illegible], coacti sumus librationis [illegible] summas imis (quae aequa[illegible] arcubus respondent) facere [illegible] summas, longas imas. [illegible] circulari planetae itinere [illegible] pro $\theta\alpha$, $\epsilon\alpha$, hoc est pro [illegible] sequitur nitro, partes [illegible] $\gamma\alpha$, $\mu\zeta$ esse aequales. Ita quod cap. XXXIX. [illegible] deprehensae veritatis. [illegible] partes mediae $\iota\mu$ adhuc sunt majores extremis $\gamma\alpha$, $\mu\zeta$, [illegible] quod sit naturae consentaneum, contra quam [illegible]. Sed et illa difficultas, quae cap. XXXIX. [illegible] planetae pro signo accessus et re[illegible], ut apparebit capite LVII. Igitur [illegible] mihi hic praedicto modo deprehendere, [illegible] esse EB, respondentem cons[illegible] anomaliae generaliter conclusi de [illegible], sed opus erat crebris observatio[illegible]

[illegible] servire [illegible] observata [illegible]

Fig. 110.

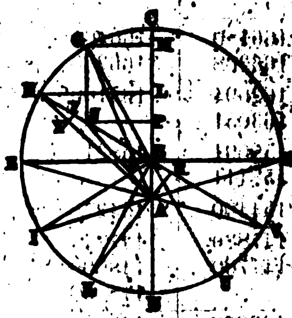


Fig. 111.



Ex observationibus cap. LI.		
In descendente semicirculo.	In ascendente semicirculo.	Computata ex libratione.
166180 166208	166401 166296	166228
162994 163051	163100	163160
158091 158111	158217	158074
154400	154278	154338
147820 147760	147743 148000 148050	147918
139060	138984	139098

In observatio... opus est idem ... adhibui distant... computanda ... illas prius hac ... thodo inquisivi ... observationes ... erunt igitur ... omnem ecc... tionibus ... confirmari ... cap. XXXIX ...

Caput LVII.

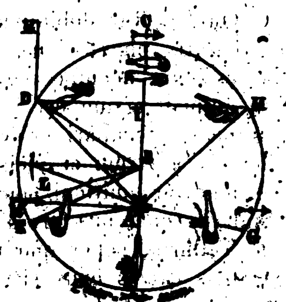
Quibus naturae principiis efficiatur ut planetae ... diametro ...

Apparet igitur ex certissimis observationibus ... aetherea non sit circulus, sed figurae ovalis ... parvi circuli hoc modo: si post aequalia ...

[illegible] [illegible] converteret diceretur; quod quidem diximus cap. XXXIX. [illegible] observationum repugnare clarissime. Cum igitur men[illegible] [illegible] hujus digitum admodum naturalem intendat, causa [illegible]que [illegible] nempe non mens planetae, sed naturalis aut forte corporalis [illegible]

[illegible] nobis cap. XXXIX. ex optimis rationibus in praesuppo[illegible] planetam transitionem facere de loco in locum, nuda con[illegible] [illegible] ipsarum, nisi adjuventur aut informentur illae a vi extranea: [illegible], si quo pacto ipsi etiam virtuti Solari transscribamus [illegible] ex parte. Id molientes ad remos nostros jam supra [illegible] introductos relegabimur. Sit enim flumen aliquod circulare [illegible] sit facta, qui remum duplo [illegible] periodici planetae semel convertat vi [illegible]bilissima, sic ut in C remi linea [illegible] Sole sit recta, alternis reditionibus [illegible] nunc puppim in consequentia [illegible] vero sit linea remi pars lineae [illegible] ceteris sint inclinationum inter[illegible] [illegible] in D, E super remum [illegible] navem versus A, a C parum [illegible] et inclinatur illa; sic et [illegible] arenulo flumen in remum [illegible] in D, E vero fortius, quia hic [illegible] hunc accessum dispositus est [illegible] contrarium evenit in semicirculo ascendente. Flumen [illegible] in G, H expellet illum a Sole. Simul et hoc [illegible] in G fortior sit impulsus quam in F, eo quod flumen [illegible] in F forte. Atque id etiam ad votum nostrum, [illegible] aequalia spatia sequebatur, quarum in supe[illegible] [illegible] quam in inferioribus.

Fig. 113.



[illegible]

petat Solem; retineatur autem contra suam magneticam [illegible]
petentem in tralatione globi perpetuo sibi ipsi [illegible]
successu seculorum ab aliis ad alias fixas [illegible]
aphelii progressum hoc modo causatur: quorum [illegible]
opus esse posse fateor, ut quae ad hunc motum ab [illegible]
est instructa, cum sit motus non totius corporis [illegible]
motus supra cap. XXXIX. causae motrici planetae [illegible]
fuit), sed partium circa centrum totius quasi quiesc[illegible]
globo Telluris directionis hujusmodi axis exemplum [illegible]
dum axis Telluris annuo centri circumactu sibi ipsi [illegible]
manet propemodum aequidistans, aestas et hiems [illegible]
longissima secula illum inclinant, fixae progredi [illegible]
cedere.

Quid igitur dubitamus, attribuere planetis [illegible]
centricitatis phantasiam, quod uni illorum (Telluri) [illegible]
praecessionis aequinoctiorum, Solisque surgentis [illegible]
actu animadversum est inesse? Ubi quemadmodum [illegible]
existimans, peculiari principio opus esse, quod [illegible]
trione in austrum et vicissim libret, sic ut aestus [illegible]
molitione circumitioni commensurata resultet, [illegible]
et siderii (quatenus fere aequales sunt); cum [illegible]
axis Telluris, super quo fit diurnus motus, [illegible]
extraneis causis opus sit, nisi ad unicam [illegible]
noctiorum: ita hic quoque nullo consilio [illegible]
sine corpus simul circa Solem velut [illegible]
librationem absolvat. Aliquin [illegible]
modo de progressu apheliorum [illegible]

Etenim, lingula in C versante, et [illegible]
accedat vel recedat, cum capite [illegible]
suras utique mucronem ad Solem [illegible]
et parallelum tenet axem [illegible]

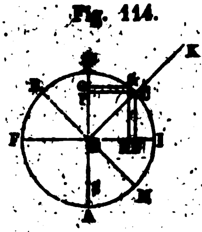
[illegible]

[illegible] partibus fortiorem quam annutum axis ad Solem, [illegible] adversario tam imbecilli vel nihil vel parum admodum [illegible] rursum capiamus ex magnete. In eo manifestissime [illegible] duae virtutes, altera directionis ad polum, altera ferri ap- [illegible] lingula seu acus nautica dirigatur versus polum, acce- [illegible] a latere, acus a polo declinat parumper et ad ferrum in- [illegible] nonnihil indulget familiaritati ferri, sic tamen, ut plurimum [illegible] adeo fieri putat Gilbertus, ut lingula a polo ad prae- [illegible] continentes declinet, atque ita causa declinationis hujus [illegible] tractibus, prout a dextris vel a sinistris altiores, majo- [illegible] in propinquo sint.

[illegible] opera et aequabilem utrique facultati naturali ope- [illegible] possumus, et contemperatione utriusque non obscuram [illegible] veram ostendere causam translationis apheliorum. Esto [illegible] dirigendi axis in Solem deroget nonnihil virtuti retentrici [illegible] ad illam proportionis. In semicirculo igitur aphelii, ut [illegible] versus H annuet parumper, hoc est in antecedentia, [illegible] a Sole, vincens parumper vim retentricem. Itaque aphe- [illegible]. At in semicirculo perihelii, ut in F, annuet idem [illegible], hoc est in consequentia, rursum vincens vim retentricem in [illegible] igitur aphelium fiet directum et velox. Quia vero brevior [illegible], et Sol propior ipsi F quam ipsi C, ideo et vis con- [illegible] ad Solem fortior in F quam in C. Plus igitur [illegible] in F quam in C. Non tantum igitur compensat nutus [illegible] nutum aphelium in antecedentia, sed etiam su- [illegible] patet, cur apsides progrediantur, non retroce- [illegible] a nobis inventum valebit tantum in anomalia coae- [illegible] axis virtuosus in Solem ipsum porrigitur, qui [illegible] motus aphelii spiralis, ut infra cap. LXVIII. [illegible]

[illegible]

Fig. 114.



pendicularis agatur FBI. Igitur [illegible]
ut BI in centrum tendat Solis. [illegible]
Anguli enim DBI, ABI sunt [illegible]
fortes, ille ad appropinquandum, [illegible]
igitur est quasi aequipondium [illegible]
centrum Martis hoc pacto in apheli[illegible]
lio, remotissimum a Sole. Sumatur [illegible]
mensurans angulum anomaliae coaequ[illegible]
et producatur in K. Collocetur [illegible]
in Solem tendat, qui sub K intelligitur. Quaeritur [illegible]
accessus planetae. Accessus enim fit, quia D polus [illegible]
Solem angulo DBK; A vero fugiens abnuit angulo [illegible]
naturalis ista anguli fortitudo, erit in ratione [illegible]
DA perpendiculari, quae sit CP, erit inter DP, PA [illegible]
enim ex trutina KB suspensa, et manentibus [illegible]
pondus brachii BD ad pondus brachii BA, ut [illegible]
brachiis ex CP suspenderentur in P, et pondus BA [illegible]
PD, pondus vero brachii BD ipsi PA, tunc DA [illegible]
facerent rectos angulos. Vide Optica mea, et [illegible]
experimentationibus. Ut igitur DP ad PA, sic [illegible]
fortitudinem anguli DBC. Fugae igitur vim [illegible]
vim PA. Ante a PA aequalem ipsi DP [illegible]
mensura virtutis appetentiae solitariae, [illegible]
proportione, qualium AD metitur vim [illegible]
dimidia DB metitur vim maximam, [illegible]
PB, hoc est sinus CN anomaliae coaequatae [illegible]
eadem hoc situ planetae ad Solem. Igitur [illegible]
mensura fortitudinis accessus planetae ad [illegible]
[illegible] mensura est.

[illegible]

[illegible] 15° ostendit $\frac{3407}{100000}$, quod admodum paulo minus est illo. [illegible] 30, quae est 792598, ostendit per [illegible] proportionem librationis 13691 de 100000. At sinus versus 60° [illegible] summa sinuum 60, quae est 2908017, ostendit [illegible] sinus versus 60° sit 50000. **)

[illegible] demonstratum sit, magnete aliquo sic accommodato, ut [illegible] esse in coelo corpora planetarum ad Solem, [illegible] magnetici futuram talem, quam metiatur sinus versus [illegible], testentur vero observationes, corpus planetae librari in [illegible] verai anomaliae eccentri: valde igitur consentaneum est, [illegible] esse magnetica, sic ad Solem disposita, ut diximus. [illegible] est, non esse valde male factum, quod arcus IO et [illegible] *) Quando dico, IO arcum in corpore planetae esse [illegible] consequentae, tunc loquor proprie, et tunc GN est [illegible] fortitudinis illius, quae competit planetae, cum Solem in [illegible] Quando vero dico, IG esse mensuram anomaliae eccentri, [illegible] anomaliae IO, loquor improprie, abusus circulo corporis [illegible] repraesentandum eccentrum. Cum autem in descendendi [illegible] major arcus anomaliae eccentri minori consequatur [illegible] IO, plures omnino sinus colligimus in IG quam in [illegible] Cum enim sinus metiatur fortitudinem, et fortitudo [illegible] pro rata propinquitatis ad Solem [illegible] hoc est, ut brevis sim, pro rata IG arcus [illegible] IO constituendi, quot in IG inveniuntur. [illegible]

[illegible]

Hoc pacto accessus ille libratorius citra mentis [illegible] insita quidem et solitaris, perficitur, sed cujus [illegible] corpore Solis dependet. Definitur enim vis Solis [illegible] giens. Ac etsi vis haec inter magnetes, quos [illegible] mutua, ego vero supra cap. XXXIX. de Solis nega[illegible] tractricem: intelligebatur tamen tantummodo, [illegible] pato argumento patet. Hic autem ponitur simul [illegible] repultrix. Vel etiam hoc ponatur, ut Sol instar [illegible] tantummodo petatur, non vicissim petat: cum ipsius [illegible] circularis, planetarum vero hic ponantur recta [illegible]

Sufficit mihi ex hoc exemplo magnetis demonst[illegible] in genere. Ceterum de re ipsa in specie ambig[illegible] attinet, certum est, axem ejus, cujus aequabili et [illegible] anni tempora efficiuntur in punctis cardinalibus [illegible] librationem et ad aphelium, cum Solis apogaeum [illegible] pene coincidat cum punctis solstitialibus, non [illegible] quod nobis esset oppertunum, nec manserit in [illegible] cardinalibus. Quodsi hic axis non est idoneus, [illegible] pars idonea esse videtur, cum nullus ejus tractus [illegible] sit, toto globi corpore circa priorem illum axem [illegible] motione circumvoluto. At vero, si nulla plaga [illegible] nullas absolvere potest omnia illa planetis pr[illegible] mediorum, idoneas scilicet diametri corporis [illegible] petua aequidistantia, qui defectus jam in uno [illegible] Telluris apparuit, accusatur ergo mens [illegible] ex contemplatione diametri Solis [illegible] tionis, quas conficit, et praesideat [illegible] accommodandi suo globi in situ parallelo [illegible]

[illegible]

[illegible] planetae mens, siquidem ei aliqua adjuncta est, spatia, quae [illegible] non aliter percipit, nisi argumento auctae diametri Solis, [illegible] dictum, oportebit ei innotescere sinum versum anomaliae [illegible] ad ejus praescriptam diametrum Solis augeat accedendo. [illegible] hujus rei haec est. Sit enim planeta post aequales [illegible] CD, DE, EF, in γ, [illegible] puncta D, H, secante DH [illegible] in I. *Quia ergo rectae $\delta\kappa\theta$*, [illegible] *in similes arcus cum* [illegible] *constructione, erit ut* CF *ad* CI, [illegible] *altenius mensura.* [illegible] dico etiam secutarum, [illegible] accumulentur incrementa [illegible] ex γ, κ, μ, ζ inspecti, qua [illegible] sinus versus anomaliae coae[illegible] demonstrare hic impos[illegible] vero facile poterit, in [illegible], si media et extrema simul [illegible]. *Igitur in C anomalia coaequata est nihil, sicut* [illegible] *ex γ inspectus apparet minimus, ita ut incrementi* [illegible] *nihil. Sic in F anomalia coaequata est 180°*, [illegible] *integra diametro 200000 et Sol ex ζ inspectus* [illegible] *incrementum ejus totum [illegible].* [illegible] *coaequata 90° [illegible] perpendicularis* [illegible] MB. [illegible] *cum [illegible] Fig. 114.* [illegible] *(Eucl. III, 18) et MAB rectus* [illegible] BA *aequales ex constructione, ut et* [illegible] *aequalia et congruentia* [illegible] *perpendicularis* [illegible] MAB [illegible]

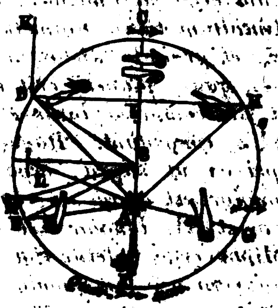


Fig. 115.



Fig. 114.

[illegible]

itaque de extremis et medio, quod hoc pacto, ... diur a planeta in proportione sinuum versorum ... Solis augeatur in proportione sinuum versorum ...

Id majoris evidentiae causa etiam hinc ... BL (Fig. 115) ex B ipsi CF ad perpendiculum ... aequali ipsi BC scribatur arcus, secans BL ... Cum ergo sit anomalia eccentri CBL 90°, erit ... dimidium totius diametri; quare et libratio γβ ... γξ, et proinde distantia erit βα. Et vero aequalis ... AL, quare planeta erit in L. Et quia ipsi BC ... et BL commune latus et LBA rectus, ... ALB congruunt. Itaque ipsi AM aequalis est ... ipsi αν ut supra, ergo et BL. Sed αν, ... longior est quam αν, subtensa anguli ... αο, et AL longior est quam BL, ... Minor ergo videtur Sol in distantia AL, ... tia vero αο jam modo videbatur ... quare in distantia AL apparet Sol minor ... dium de semicirculo eccentrici est abscissum, ... menti accessit diametro Solis. ... est dimidia 90°. Atque hoc illud est, quod ... praecedenti cap. LVI. dictum. ... circulus, augmentum diametri Solis ... anomaliae coaequatae, cujus observatio ... observatio coaequatae, ut ...

Si ...

[illegible] planetae ad B. Et sic ipsum B quasi centrum posterius est [illegible], si vere inspiceretur a planeta, prius [illegible] ipso [illegible].
[illegible] causis nego sinum versum anomaliae eccentri [illegible] ministrare planetae librationis suae, non quod [illegible] sit, sed quia, etsi sit, a planetae tamen mente non [illegible] augendam et minuendam Solis diametrum planetae [illegible] adminiculo, per quod ad justas et se ipsis imperceptibiles di[illegible] suis pervenit, huicque diametro Solis variandae [illegible] proxime expedita regulam demus et mensuram a planetae [illegible] anomaliam eccentri coaequatam, in schemate EAC vel [illegible] igitur statuas nostras. Nam utraque signa sunt percepti[illegible] librationis, crescens et decrescens magnitudo diametri Solis; [illegible] seu anguli, tria puncta corporibus vestita. Nam in A [illegible] in D planeta, in K fixa, index aphelii.

[illegible] itaque dicendum erit, (quod quidem et jam supra cap. XXXIX, [illegible] quod naturae vires non sufficiant motibus coelestibus admini[illegible]) planetae tributum esse sensum lucis fixarum Solis [illegible] concursu apud centrum planetarii corporis angulum [illegible] aestimet.

[illegible] difficultas est expedienda: quam ob rem non hic ipse angu[illegible] planetario, quod est hic augere diametrum Solis [illegible] quod pro angulo ejus sinus versus? [illegible] Et quibus mediis [illegible], coaequatae percipiat? Utrum ipse quoque more [illegible] in geometricis proficiat? cum tamen nullum [illegible]

[illegible]

petus finem dirigat: nisi quatenus succedit [illegible]
Orietur itaque pugna facultatis animalis cum [illegible]
animalis: non aliter atque cap. XXXIV. [illegible]
naturaliter quietem appetere, sed moveri [illegible]
accommodatius exemplum. Brachii humani [illegible]
ad Terrae centrum; animalis vero facultas haec [illegible]
supra caput extendat et in gyrum agat: ubi [illegible]
rale pondus, vinceretque perpetuo, nisi [illegible]
tatibus mortale conditum esset. [illegible]

His itaque positis planetae mens [illegible]
[illegible] atem magneticum comparatae; cum [illegible]
Solem, intelligere et percipere poterit [illegible]
confirmari videtur etiam per exemplum [illegible]
trali linea Solis et Terrae fortitur incitari ab [illegible]
[illegible] fortitudinem. [illegible]

Tandem igitur summa haec erit: [illegible]
ad Solem nititur, sed provehitur [illegible]
hanc promotionem sequitur angulus KDA [illegible]
fortitudinis ipse planeta Solis [illegible]
minuit distantiam, ut sit AD [illegible]
igitur mutatur KDA angulus, calculum [illegible]
Solis diametrum RA efficitur [illegible]
nec in nostris cogitationibus [illegible]
considerationi, sed plane contineri [illegible]
[illegible] Dixi hanc [illegible]
[illegible] planetae tribuatur [illegible]
videamus, sequitur [illegible]
insita, et si omnino necesse [illegible]
conjiciendo liceat illam [illegible]

[illegible] magneticae, insitae ipsi planetae, ut [illegible] explicatum [illegible] facit virtutes magneticae, quid opus illis est [illegible] etsi de magnetica vi, ipsis corporibus planetariis [illegible] contemplatione axis Telluris, qui diversi [illegible] linea [illegible] difficultas utrinque communis est. Nam et mente [illegible] admittere talem axem, qualem in Tellure desi- [illegible] mens apprehendat fortitudinem angeli seu ejus [illegible] vehementer urget nos verisimilitudo, ut librationem hanc [illegible] controversiam leges naturae sequitur, naturae [illegible] quomodocunque ea insit corporibus planetarum. Adeoque [illegible] comprehensionem sensitivam Solis et fixarum, quam [illegible] planetae indulgeo, nescio an sufficienter lectori philo- [illegible]

[illegible] quod in ipsis etiam modis, quos menti praescripsimus, [illegible] esse, probatissimos, implicari videtur quaedam incerti- [illegible] nescio an non a Deo ipso repudietur, qui hactenus [illegible] via progressus esse deprehenditur. Nam si planeta, [illegible] insita vi appropinquaverit, in alium et alium gradum [illegible] venit (ut quidem venit); et si diversi gradus [illegible] planetae vim appropinquandi intendunt; [illegible] appropinquationis seu [illegible] diametri Solis [illegible] denique sibi ipsi fiet ex parte mensura, et in [illegible] prius et posterius, cum sit per partes inaequalis et [illegible] indiguerit. Quo pacto non demonstrative, sed quasi [illegible] exploratio temperandarum [illegible] sese expediant eodem corporis circumactu [illegible] progressum apheliorum [illegible] velit. Sed nos supra cap. XXXV. [illegible] ab [illegible]

[illegible]

[illegible] pro regula, ut dictum est, augendae Solis [illegible]
coaequatae; et ejus sensu exiguum ad tempus [illegible]
posset, si diis placet, compensare quod neglexisset [illegible]
et anomaliam coaequatam reducente in [illegible]
si qua est, animali facultati, eaque alias [illegible]
nata. Cur non igitur et hic ea extra ordinem [illegible]
discrepantiam mensurae (anomaliae coaequatae) et [illegible]
quae per Solis eclipsin irrepserat? Quid quod [illegible]
tardi motus, ut aequinoctiorum praecessio, orta ex [illegible]
ad alias atque alias fixas, non ad Solem? ubi [illegible]
luminis aversio, cum nec ejusdem praesentia illam [illegible]

Itaque ut ἀναφοράζειν magneticarum effugiamus, [illegible]
propriis planetarum librationibus, non minus quam [illegible]
mini rapta ex Sole, dicendum est, similis quidem [illegible]
corpora causa magneticae dispositionis, sed [illegible]
quam ut orbes virtutum planetarum [illegible]
ex Sole emanantem (non minus illam, quae [illegible]
actum elicit, quam illam, quae illos in [illegible]
cillioris corpusculi impediri omnino possit, sed [illegible]
aquam transit; aut tantae exilitatis esse corpora [illegible]
ciant; nec Solem unquam alli planetarum [illegible]
planeta in solidum intercipi, quemadmodum [illegible]
solidum intercipitur. Nam etsi Lunae [illegible]
potest, at Luna non libratur versus Solem, [illegible]
ipsa privari nunquam potest, cum [illegible]
lum intersit [illegible]

Quod si tamen alicui videtur [illegible]

[illegible]

Caput LVIII.

[illegible] *ratione, capite LVI. demonstrata et inquisita, quasi* [illegible] *in prae*[illegible]*ra librationis applicatione; qua iter planetae buccosum efficiatur.*

[illegible] me Galatea petit, lasciva puella,
[illegible] fugit ad salices, et se cupit ante videri.

[illegible] verum hoc de natura cano ex ore Vergilii. Quo propius enim [illegible] hoc petulantiores ludos facit, hoc pluribus anfractibus sese [illegible] jam jamque tenenti surripit; nec tamen invitare cessat [illegible] quasi delectetur meis erroribus. [illegible] hoc opere spectavi, ut physicam invenirem hypothesin, quae [illegible] efficeret observatis consentaneas, sed etiam aequa- [illegible] quas hactenus ex vicaria capitis XVI. coacti sumus [illegible] per hanc etiam verissimam hypothesin tentans falsa methodo, [illegible] summa trepidare coepi. *In linea* [illegible] *A, B describantur aequales circuli GD,* [illegible] *DB eccentricitas circuli GD. Sit autem* [illegible] *seu numerus graduum ejus,* [illegible] *aequipollentiam cap. III. Centro* [illegible] *KD, quod ipsi AB est aequale,* [illegible] *qui secabit circulum GD in* [illegible] *cap. III. Ducatur ME et* [illegible] *epicyclum in L, et sit LD* [illegible] *secanti GD vel HK. Et* [illegible] *Et puncto vero D* [illegible] *in GA, LA, quae sint DC, DE. Quare* [illegible] *LVI. demonstrata, AE erit contro*[illegible] *ad hanc anomaliam coaten-* [illegible] *temporis in ea sit con-* [illegible]

Fig. 117.



[illegible]

ellipses, omnino existimans, me sic longe diversissima [illegible]
hypothesin, cum plane coincidant, ut capite sequenti [illegible]
quod, quae peccaveram prius in methodo, [illegible]
F pro I, ita ut debuit, usurpatum. At [illegible]
cap. XLIX. L. et LVI. Circulus cap[illegible]
cap. XLV. peccat defectu. Et sunt excessus ille [illegible]
Inter circulum vero et ellipsin nihil mediat, nisi elli[illegible]
est planetae iter; et lunula a semicirculo resecta [illegible]
latitudinem, scilicet 429. [illegible]

Quodsi iter planetae esset ellipsis, satis [illegible]
usurpari: quia, si hoc fit, iter planetae [illegible]
angulis GBD, HAK *aequales infra* QBP, SAR [illegible]
rursum epicyclus PT *priori aequalis*, *et ex* P [illegible]
eccentrico; *perpendiculares in* BQ, AR *cadant* [illegible]
P *cum* B, *et centro* A, *diastemate* AM, *circuli* [illegible]
in O, PB *in* N. *Est igitur analogum superioribus* [illegible]
mus I, *jam pro* O *usurpemus* N, [illegible]
longitudine, *sic et situ justam esse*. [illegible]
iter planetae buccosum. *Nam aequalis* [illegible]
ex communi centro ejectae [illegible]
latitudinem lunulae, *versus* [illegible]
DI, *major* PN. *Cum* [illegible]
Et *vero circulus major*, *utpote longiore radio* [illegible]
utpote breviore radio AM: [illegible]
est igitur resecta lunula superius [illegible]
in ellipsi lunula haec aequalis est latitudini [illegible]
et Q [illegible]
ellipsin, [illegible]
[illegible] injustas praebere. [illegible]
[illegible]

Caput LIX.

... librati in diametro epicycli, fiat per... ...metiatur summam distantiarum ellip... ...entiae punctorum.

Protheoremata.

... describatur ellipsis, tangens verticibus circulum ... et per centrum et puncta contactuum ducatur diameter, ... aliis circumferentiae circuli ducantur perpendiculares in ... omnes a circumferentia ellipseos secabuntur in eandem ...

... Apollonii Conicorum pag. 21. demonstrat Com... ...mentario super V. Sphaeroideon Archimedis. ... ABC, in eo ellipsis ABC ... in A, C, et ducatur diameter ... contactuum et per H centrum ... circumferentiae K, E descen... KL, EH, sectae in M, B ... ellipseos. Erit ut BH ... omnes aliae perpen... ...psis sic inscriptae ... proportionem eandem ... HA ... HE, sic area ellipseos ABC ... ABC. Est ... Sphaeroideon ...



Fig. 118.

... puncta diametri ... lineae in ... ellipseos ... perpendicularis ... ML ad LK ... AMN ad AEN ... ML ad LK ...

Probatum enim est supra cap. XLVIII, [illegible]
ferentia ea, cujus diameter est medi[illegible]*proport*[illegible]
ellipseos, ut cujus circuli area (Arch, [illegible] *VI*[illegible]
seos. Sed et medium arithmeticum [illegible]
Proxime ergo aequalia sunt ista.

VI. Quadratorum proportionaliter [illegible]
ut quadrata.

Sint duo quadrata PL *et* SH. *Horum* [illegible]
proportionaliter in punctis M, B. *Scribantur* [illegible]
Ergo quia ML *ad* LK *sic est ut* BH *ad* HE; [illegible]
RH *ad* HS. *Sed gnomones sunt quadratorum* [illegible]
ut LP *ad suum gnomonem, sic* HS *ad suum.* [illegible]
HS *sic gnomon* KOQ *ad gnomonem* ORE.

VII. Si a termino semidiametri brevioris [illegible]
extendatur linea aequalis semidiametro longiori [illegible]
semidiametro longiore: quae inter punctum [illegible]
potest gnomonem, quem quadratum semidiametri [illegible]
rato semidiametri brevioris.

A brevioris semidiametri HB *termino* [illegible]
semidiamet[illegible]*ngiori* [illegible] HN [illegible]
esse media[illegible]*portionali*[illegible]
stratum est supra cap. [illegible]
[illegible]
HE *vel* HA, *per* VI [illegible]
quadratorum BH *et* BN, *hoc est* HB [illegible]
aequale est quadratum [illegible]

VIII. [illegible] circulus [illegible]
puncta [illegible]
[illegible]

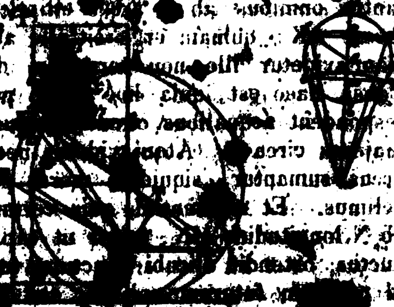
[illegible] TI junctas. Et aliqua summa [illegible] KH, HI [illegible] copu[illegible] KI, TI. Cum autem summa [illegible] inveni[illegible] AK ad partes ejus inaequales, crea[illegible] HA, HK, partim cum sinubus in HN [illegible] cum area KNA, per praemissam [illegible] metitur summas distantiarum [illegible]

[illegible] ellipsis in aequales arcus ellipsis [illegible] circuli in protheoremate VIII. ratio est con[illegible] arcuum circuli et ellipsis, protheoremate IV. explicatae. [illegible] eccentrico in contraria eductae excedunt lineas ex [illegible] eductas in minima proportione, et plane nihil circa [illegible] longitudinibus mediis excedunt illas maxima proportione.

[illegible] igitur, ut protheoremate VIII, area [illegible] summas distantiarum aequalium [illegible]

[illegible] expediam. Si in ellipsi, [illegible] ut supra [illegible] ellipsis cum [illegible] in [illegible] gradus ab [illegible]

[illegible] Fig. 119.



[illegible]

aequat gnomonem ERC, *per VII. Ergo* ... ERC: *ac proinde potentia* ... *pinato, aequabit gnomonem* KOQ ... *est excessus ipsius* δα *circumferen*... *gnomon* KOQ, *aequalis illi, est exces*... *Sed* KN *est aequalis ipsi* δα. *Ergo* ... *Eodem vero gnomone excedit et quadratum* ... *matrales sunt aequales. Quod* ... *demonstrabitur, quod aequet ipsam* ... *Et sic de omnibus.* [2])

XII. Porro indidem etiam hoc patet, ... et per partes singulas, sit mensura genuina ... arcus elliptici itineris planetarii a centro Solis ...

Nam per IX. horum, si totius circ... *libus distantiis omnibus* ... *areas illius ut* KNA, *terminatas ad* ... *citas, aequiparantur illis distantiis* ... KA *aream illam complexo.* ... *distantia*... *hoc est* ... MN, N... *distantia*... *centrum* ... *distantiarum, qu*... *elliptica*... *habet aream circu*...

XIII. Oritur ... dubi... *tantiis omnibus ab* ... *incedit* ... K: quinam ... Nam videtur ... Causa haec est, quia ... respondent aequalibus ... majore circa ... Atq...

[illegible] tantum obtinuimus, ut certum esset, circa A, C [illegible] debere. [illegible] hi ipsi arcus, per XML per[illegible], sint [illegible] arcus, nondum constat. Jam [illegible]

[illegible] ellipsin A[illegible]C in arcus quotcunque aequales divideret, [illegible] ab N distantias assignaret, pro summis vero distantiarum [illegible] arcus [illegible]N, ABN, ABCNA: et per X. protheo[illegible] cap. XL. accidit, cum hoc ipsum [illegible]co, quod hic tentari ponitur in ellipsi: ut scilicet [illegible] punctorum Y, M ex centro H oppositorum, censeren[illegible]

[illegible] divideret ellipsin AMC in arcus totidem inaequales, [illegible] hac lege, ut diviso primum circulo AKC in [illegible] arcuum terminis ducerentur in AC per[illegible] ellipsin AM etiam in arcus, atque pro horum [illegible] pararetur area elliptica: tunc errori commisso [illegible] perfectissima.

[illegible] *quadr*[illegible] A *et* C; *de* [illegible] B; *et* [illegible]

[illegible] A, C *et* [illegible] NA, NC [illegible] BE; [illegible] HE *ad* [illegible] *Si ergo* [illegible] NA, NC [illegible] NA, NC *non* [illegible]

[illegible] AM [illegible] *et* LM, *hoc est* [illegible]

apsidibus A, C incipientibus: tanto pauciores …
utpote a magnis arcus partibus …
non possunt distantiae, ob brevi…
ut justas moras accumulent: hic, …
nactae, peccarent, id latius et laxius …

Dixi de initio et fine, quod eadem …
incipiant differre et arcus circuli …
justae, ab iis, quas area ellipsis, …
proportione desinant differre, nimirum proportio…
in B, E, distantiae vero in A, C.

Dicendum nunc est idem etiam de progress…

Etenim lineae NA, NC *a parvis initiis* …
rant aliquo notabili lineae ABC; *et vicissim* …
BN *ipsam* HB, *ibi incrementa* …
circa anomaliam eccentrici 45°. *Patet* …
angulo et secantibus. Quantum enim secans …
differt a sinu toto, tantundem …

[illegible] prius innotuit per experientiam in hunc modum. Con[illegible] anomaliae eccentri pro distantiis ab N lineas KT, TI [illegible] etiam ordine ad summam priorum adjeci. Collectis [illegible] 360[illegible], ut par est. Comparatis igitur singulis [illegible] (per regulam proportionum) summa 36000000 [illegible] essent [illegible] (temporis totius restitutorii) ut summae singulae [illegible] praecisissime prodiit idem, in secundis etiam [illegible] dimidiam eccentricitatem in sinum anomaliae [illegible] area circuli, quae valeret itidem 360° (nomen [illegible] restitutorii), comparassem. Deinde, cum essem in ea [illegible] distantiam NM applicandam esse lineae KH, ut esset ZN, [illegible] coaequatam ZNA inquisivissem, attribuens eam anomaliae [illegible] manifeste dissenserunt aequationes a mea hypothesi vicaria [illegible] circa 45° coaequatae excessus a vero, per experientiam [illegible], $5\frac{1}{2}'$ defectus; circa 135° circiter 4'. At AM sic [illegible] terminaretur, tunc [illegible]NA coaequata applicata mediae [illegible] [illegible]sime cum vicaria, hoc est cum observationibus [illegible] constaret de re ipsa, postea implens [illegible] inqui[illegible] semel susceptis ipsis etiam ca[illegible] hoc [illegible] fieri artificiosissime et [illegible]issime, [illegible] quod, [illegible] loco princip[illegible] essent, [illegible] considera [illegible] [illegible] disputationis [illegible] perplexi[illegible] [illegible] quod haec [illegible] [illegible] necessaria [illegible] [illegible] statuunt [illegible] philosophi [illegible] [illegible] rogo [illegible] Apo[illegible] [illegible] materias [illegible] ita [illegible] comprehendam [illegible] quae est [illegible] historum [illegible]

[illegible]

Caput LX.

[illegible]

circuli AK, datur area AHK, sector areae AK, [illegible]
sector iste in ea mensura, in qua tota circuli [illegible]
datur arcus AK, datur et sinus KL. Ut [illegible]
sic HKN area ad HEN aream, ut dem[illegible]
detur HN eccentricitas, dimidium ejus in[illegible]
cujus valor semel statim initio inquirit[illegible]
valeat tempus 360°, quid haec valeat [illegible]
HEN, facillimum est inquirere per regulam [illegible]
enim EH ad KL, sic NEH ad NKH, atque [illegible]
minutis et secundis; quae addita ad valorem K[illegible]
suram temporis, quod planeta conficit in AM [illegible]
pars aequationis, quam dico (a) physicam, [illegible]
sic adorno, ut aequationis mentione non sit [illegible]
sit, quae partem aequationis (b) opticam, id [illegible]
Mihi magis familiares erunt termini anomaliae [illegible]
anomaliae coaequatae. (c) Anomalia media [illegible]
minatum ejusque mensura area AKN. (d) [illegible]
planet[illegible] ab apogaeo, areae ac AM ellipseos [illegible]
AK, [illegible] coaequata est [illegible]
[illegible] (vid. [illegible]

[illegible]

coaequ[illegible] [illegible]) Hic facile quivis [illegible]
mut[illegible] Vicissim, data eccentric[illegible]
eccentr[illegible] [illegible]
analysin [illegible]
suram anguli [illegible]
culi, [illegible]

[illegible]

Fig. 420.



[illegible] EFD *major* [illegible] FDH [illegible] *occurri*, *sed quantitate* [illegible]. *Cumque* FED *sit paulo* [illegible] *et arcus ipsi* FED *circumscriptus* [illegible]: *ac ideo* ED *ad* DF, [illegible] *qui paulo superat* [illegible] [illegible] *ad sinum*, [illegible] [illegible] *igitur* [illegible] [illegible] *longitudine*, [illegible] *quam* [illegible] *sinubus complementi* [illegible]. *Nam manente longitudine* [illegible] [illegible] DH *est* [illegible] [illegible] *maximus*, [illegible] DFH [illegible] [illegible] *arcus* [illegible] FD [illegible] [illegible] *cum* [illegible] FED, *crescit* [illegible] FE [illegible] *in* [illegible] *lineae* DH [illegible] HD *com-* [illegible] *arcus* [illegible] FD [illegible] [illegible] *omnia* [illegible].

[illegible] *apsi-* [illegible] *ad* [illegible] angulī [illegible] [illegible] sinuum, et proportione sinuum, com[illegible] [illegible] est in proportione rectangulorum quad[illegible] [illegible] sinubus [illegible] in [illegible] complement[illegible] [illegible] ad [illegible] se habeat ad angulum maxi[illegible] [illegible] ut rectangula cetera ad singulas c[illegible]

[illegible] HD [illegible] *longitudo* [illegible] *in proportione* [illegible] *ingressus, quasi ex* [illegible] [illegible] 90 [illegible]

planetae justus, *et* I [illegible] N [illegible]
XG *ad* GI (*per I.*); [illegible] VD *ad* DH [illegible]
tudinem triangulorum, *ut igitur* FD [illegible]
aequales FDH *et* [illegible]
centrum eccentrici, N *vero* [illegible]

V. Anguli, quo coaequata [illegible]
quata vera, quae ellip[illegible]
gulum sub sinu anom[illegible]
maliae coaequatae vera[illegible]

In schemate eodem [illegible]
VFH, *proditura erat* [illegible]
angulorum VHD *et* [illegible]
XIN *sinus idem*. *Ergo* [illegible]
quatae fictitiae, [illegible]
coaequata vera, *prodi*[illegible]
anguli ING *differentiae* [illegible]

Corollarium. Quia parva [illegible]
[illegible]
per XGN [illegible] institut[illegible]

[illegible]

[illegible] *117 sunt* [illegible] *Sit* GQ *eccentricus,* AB [illegible] *vel* LD *anomalia eccentri,* FAC *coaequata,* FA *vel* EA [illegible] *igitur* AK *ad* AB, *sic* BC *ad* KE: *et in* CAO *coaequata,* [illegible] AB, *sic* BV *ad* RM. *Igitur* [illegible] *vel* RM *ponitur esse una* [illegible] *ut supra.*

[illegible] data anomalia media, nulla geometrica methodus est, perveniendi [illegible], videlicet ad anomaliam eccentri. Nam anomalia media est [illegible] ex duabus areae partibus, [illegible] et triangulo: quorum ille [illegible] ab arca [illegible] sinu, in valorem [illegible] maximi multiplicato, [illegible] ultimis [illegible] proportiones inter arcus [illegible] huic [illegible] nisi prius exploraveris [illegible] evadat area: hoc est [illegible] construxeris et [illegible] opus eris.

[illegible] est mea sententia [illegible] habere videbitur geo- [illegible] pulchritudinis, [illegible] uti mihi solvant [illegible]:

[illegible] area partis semicirculi, datoque puncto diametri, [illegible] et angulum ad [illegible] punctum, cujus anguli cru- [illegible] data area comprehenditur. Vel: Aream semi- [illegible] puncto diametri in data ratione secare.

[illegible] credere, solvi a priori non posse, propter arcus et sinus [illegible] mihi [illegible] viam monstraverit, is erit mihi magnus

[illegible]

DE LATI[illegible]

[illegible]portione orbium [illegible] et Terrae, [illegible] it[illegible] in superioribus certi[illegible] inventa, [illegible] supra cap. XI. XII. XIII. XIV. [illegible]

Incipiamus a nodis. Anno 159[illegible] d. [illegible] fuit Mars in 4° 44′ ♈, cum [illegible] 0′ [illegible] latis; [illegible] verò 85 ½ °, [illegible] revolutionis Martis, die 28. [illegible] est Mars [illegible] altitudine [illegible] in 18° [illegible] parallaxis considerationes. Et rursum [illegible] vesperi h. 10. [illegible]

[illegible] dietim igitur per [illegible]. Cumque [illegible] Oct. h. 12. fuerit eccen- [illegible] 2⅓ [illegible] confic[i]antur die uno [illegible] parte [illegible] acced[illegible] 37½ [illegible] igitur [illegible] 16° 45½' [illegible] anno 1595. Novembris initio.

Circa nodum alterum [illegible] ita [illegible] observationes. Sustine- [illegible] anno 1589 [illegible]onis. Cum enim anno 1589. [illegible] Maji Mars habuerit [illegible] 6⅔', confecit illa, ex [illegible] latitudinis ad [illegible] diebus 2½. Maji 8. hora 20: [illegible] locus ejus [illegible] qui esset anno 1595. [illegible] nodi descendentis [illegible] ascendentem in [illegible] Nodi [illegible] 46½' ♉ m.

[illegible]

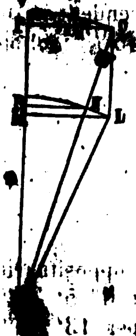
[illegible] d. 25. Aug. h. 12 [illegible] Mars Soli oppositus in [illegible] 23. fuit latitudo [illegible] 7' 30". Die 24. fuit [illegible] 5' [illegible]. [illegible] 5 decrevit latitudo per 13' [illegible]. [illegible] igitur analogiam, si die [illegible] 2' 30" [illegible]

[illegible]

Erit igitur ut distantia EK ad [illegible] ipsius lineae K [illegible] A, [illegible] EAK ad sinum AEK, [illegible] sinus EAK ad sinum AEK, [illegible] sinum apparentiae ejusdem [illegible]

Minor nota est ex doc[illegible] libri III. Triangulorum [illegible]

Fig. 123.



ergo recta [illegible] dinae perp[illegible] Q [illegible] L [illegible] N, demissa perpendicularis RN [illegible] PQ ad QR, sic RN [illegible] Q [illegible] Ut [illegible] ad [illegible] RN [illegible] angul[illegible] pingito, ut sit L[illegible] totus; QR [illegible] termini [illegible] Q. [illegible] RN est [illegible] tatur [illegible] PQ [illegible] sinus totus. Ut ergo [illegible] distantiam [illegible]

distantiam [illegible] vi[illegible] sic sinus [illegible] re[illegible] Et in praesenti [illegible] dis[illegible] ad sin[illegible] distant[illegible]

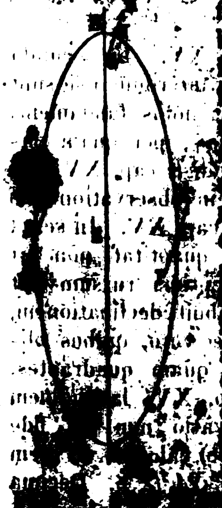
[illegible]

[illegible]	[illegible]	Inclinatio.	[illegible]	[illegible] cap. XV.
[illegible]	99228	0° 37½ [illegible]	[illegible] bor.	1° 40 [illegible]
[illegible]	98233	1. [illegible]	[illegible]	4. [illegible] vel 4° 2½
[illegible]	99724	1. [illegible]	[illegible]	[illegible]
[illegible]	[illegible]	1. 25. 42	[illegible]	[illegible]
[illegible]	[illegible]	2. 23. 20	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	6. 2½ vel [illegible] 58.
[illegible]	[illegible]	[illegible]	[illegible]	0. 3 circiter
[illegible]	[illegible]	[illegible]	[illegible]	3. [illegible]
[illegible]	[illegible]	[illegible]	[illegible] 30½	6. 31
[illegible]	[illegible]	[illegible]	[illegible]	4. 8 vel 4. 10
[illegible]	[illegible]	[illegible] 2	[illegible] 16	2. 21½ vel 2. 26.

[illegible] ad diem, [illegible] XV. [illegible] secunda [illegible] interdum usi sunt [illegible] ½ [illegible] nobis fundamenti [illegible], per quam [illegible] vidisti cap. XV. [illegible] in observatione [illegible] cap. XV. In sexta [illegible] quantitati non est [illegible] illa 2. [illegible] rursum [illegible] procul [illegible] posuit declinationem, [illegible] meridianus non fuit. [illegible] vero, quibus ob- [illegible] meridianum, [illegible] quam quadrantes. [illegible] antium, [illegible], ut est cap. XV, latitudinem [illegible] observatio non [illegible] fide [illegible] calculus ad diem [illegible] 24 [illegible]. Decima [illegible]

etiam latitudinis ratio pla[illegible] con[illegible] speculati[illegible] [illegible]
ponatur aliqua diameter la[illegible] in corpore [illegible]
[illegible]gatur in locum limitum, [illegible] axis, et in hoc [illegible]
[illegible]os per omnem ambitum. [illegible] ad illa[illegible]
est in magn[illegible] nostris directi[illegible] [illegible] polum [illegible]
Illa [illegible] S[illegible] [illegible] haec [illegible]
[illegible] appetit [illegible]
[illegible] ad [illegible] adeat[illegible]
ve[illegible], ut [illegible] ve[illegible]
quitur [illegible] planeta[illegible]
axis hic inclinationis, [illegible]
CBAD ecli[illegible], A, C[illegible]

Fig. 624.



planet[illegible] GNH, [illegible]
hunc [illegible] axis i[illegible]
fiet [illegible] ut corpor[illegible]
bor[illegible] [illegible]elato axis [illegible]

[illegible]

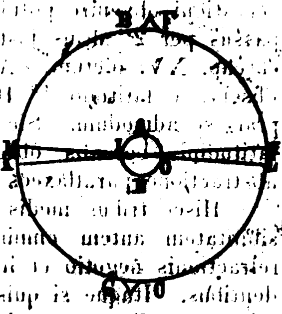
[illegible] planum sit, quod circum[illegible] orbita Martis, ejus [illegible] eclipticae regularis erit. Scriptis enim duobus circulis [illegible] BD in plano eclipticae, altero FE in plano orbitae Martis, [illegible] A Solis, hoc est in una et eadem sphaera [illegible] erit ut sinus BD arcus inter sectionem circulorum et [illegible] Martii, puta D, ad sinum totum, sic sinus incli[illegible] [illegible] sinum CE, inclinationis maximae E [illegible]. [illegible] [illegible] mensura declinationes omnium circuitus punctorum [illegible] [illegible] cap. XIII. probatum est observationum ingeniosa [illegible] nulla potest afferri instantia [illegible] hypothesi. [illegible] [illegible] difficiles expedien[illegible]nt. Altera de con[illegible] [illegible] axis, altera de axe ipso. Quaeritur enim, natu[illegible] [illegible] rationalis, naturae corporeae opus an angeli? [illegible] idem numero sit axis inclinationis cum axe magnetico, [illegible] diversi, quomodo in eodem corpore planetae globoso? [illegible] implexa quaestio. [illegible]
[illegible] praedixissem, ob [illegible] ejus virtutis, quae in [illegible] est: nisi [illegible] et transpositio nodorum succes[illegible] [illegible] discurrentis, at [illegible] [illegible] mirum et propi[illegible] [illegible] eccentricitatis. Illic [illegible] ab axe virtu[illegible] [illegible] locum sub fixis longissime distantibus. Illi[illegible] [illegible] circumlato corpore, [illegible] fuisset [illegible] [illegible], [illegible] vi directionis fortiori [illegible] [illegible] [illegible] efficiens, planeta in limitibus [illegible] [illegible] planetae [illegible]

causatur, porrigi in longitudines medias: [illegible]
latitudinem causatur, porrigi in limites. Igitur [illegible]
longitudinibus, utraque diameter eodem porrigeretur [illegible]
nihilque prohiberet quin tunc et eaedem esse [illegible]
sunt nodi seu sectiones eclipticae verae in apsidibus [illegible]
12° est ante aphelium; in Jove praecise [illegible]
lium; in Saturno 24° nodus sequitur aphelium; in [illegible]
sunt omnia omnibus permutantur. Nodus enim [illegible]
in longitudine media, nunc in perihelio. Cum [illegible]
ferant hae duae virtutes, sequitur, ut [illegible]

In uno tamen [illegible] eodem corpore [illegible]
toto, nihil impedit nisi motus seu convolutio [illegible]
moventur ut Luna, quae non convolvitur [illegible]
ostendit faciem, nihil impedit [illegible]
que, ut subtegmina sunt intexta staminibus, [illegible]
netae situm eundem respectu fixarum [illegible]
omnes omnino tractus in [illegible]
diametri situm retinebunt eundem [illegible]
agitur, qui, praeterquam quod circumferentur [illegible]
[illegible] in dies singulos, [illegible] in magna [illegible]
[illegible] LVII. relinquimus. Nam si corpus [illegible]
virtutem, quae sit parallela [illegible]
sibi ipsi aequidistans. Quodsi [illegible]
[illegible]

[illegible] requirebamus, ut nodi singulorum consistant in suas apsidas; [illegible] posse esse modos aliquos coelestium motionum, qui [illegible] corporales sint magneticorum instar, a nemine tamen in Terris [illegible] ob defectum exemplorum? quemadmodum, si nobis de- [illegible] exemplaria, ut olim quidem incognitum erat, plurima de [illegible] ignoraturi fuissemus. Qui orbes [illegible] solidos [illegible] secundum ea, quae cap. XIII. dicta sunt. Plano [illegible] Martis FE (Fig. 125) ad planum eclipticae DC tribuent [illegible], sed certam et constantem super diametro [illegible] centrum mundi A ducta (Brahaeus per centrum Solis); [illegible] seculorum circa centrum illud A [illegible] ecliptica DC converti.

Fig. 126.



[illegible] eorum circulorum maximorum in [illegible] HL et KR poli F, G et B, C [illegible] quanta est declinatio eorum [illegible] ergo poli Martis B, C circa [illegible] G describent circellos spatio [illegible] sub quibus dicent polos B, C circumire in antecedentia, [illegible] quae supra cap. XVI. est [illegible] LXIX. corrigetur.

[illegible]

Caput LXIV.

[illegible] Martis per latitudines.

[illegible] uterque nodus in locis praecise opposi- [illegible] parallaxis excludat. Esto enim, ut sit [illegible] Solis fuerit [illegible] 1595 a vertice cir- [illegible] 66°. [illegible] anno 1590 cum [illegible] adhuc [illegible]

[illegible] BAC 1° 50′ [illegible]

[illegible]

sim observatione stante perimitur parallaxis [illegible]
Martis ordinari in perfecto plano, quod [illegible]
centro Solis. [illegible]

Sed multo certius idem evincitur ex latitudinibus [illegible]
sitibus acronychiis, iis praesertim, quas observatio [illegible]
dubias non reddidit. Hoc cap. XV. dici [illegible]
tuit. Anno enim 1587, cum Mars [illegible]
habuisset 4', latitudo ex 3° 37' fuisset [illegible]
nihil ultra 3° 37' inventam fuit. Anno vero [illegible]
a vertice 64°, si Martis parallaxis ex Solis [illegible]
5½', tunc borea latitudo pro observata [illegible]
parallaxi. At nos computavimus nihil supra 1° [illegible]
servationi obvenire potuit: ut si Mars in altitudine [illegible]
passus per 2' altius justo in borea apparuisset [illegible]
et cap. XV. dictum. Anno vero 1602 [illegible]
observata latitudo 4° 10', neglecta [illegible]
praecise admodum. Sic anno 1604 non [illegible]
latitudinis borealis observatae. Igitur [illegible]
abstractione parallaxeos auctam.

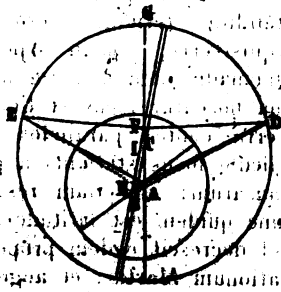
Hisce tribus modis incertitudinem [illegible]
sibilitatem autem omnimodam non [illegible]
refractionis negotio et interdum observ[illegible]
dentibus. Itaque si quis Marti parallaxin [illegible]
tribuere velit, eum observata haec [illegible]
Accommodabitur enim et inclinatio [illegible]

[illegible] habeient, si olim apsides et limites conjungerentur; quod [illegible] ante occasum totius machinae, incertum. Certe Ptolemaeus [illegible] et [illegible] aequales motus tribuit; quod si esset, nunquam fieret [illegible] hodie diversis motibus uti videntur, non sunt [illegible] observata adeo certa, nec est differentia horum motuum [illegible] astronomia adeo magna, ut certissime concludere possi- [illegible] myriadibus distent hujusmodi conjunctiones apsidum et [illegible]

[illegible] igitur aevum revertamur, quod nos inter et Ptolemaeum [illegible] hic geometricas determinationes quaerentem multiplex [illegible]

[illegible] apsides Solis et Martis non sunt conjunctae; deinde orbitae [illegible] sunt perfecti circuli. Itaque etsi trajiciamus novam lineam [illegible] circulorum Martis et Telluris, in schemate per B, C: [illegible], ut alibi quam in hac linea contingat maxima propin- [illegible]. Denique etsi constet de loco [illegible], locus limitis borei [illegible]. Ut limes est in 16° 50′ ♌, [illegible] circulorum ejecta porri- [illegible] circiter, eodem nempe, [illegible] linea [illegible] suarum apsi- [illegible] BC parallelos incedit, [illegible] eccentricitate AF in C [illegible]

Fig. 127.



[illegible] medium inter 17° ♌ [illegible] sed hic retinuit annus [illegible] 30′ ♌ observata fuit [illegible]. Cum enim in nocte quae sequitur diem [illegible] antecedenti observata est latitudo 4° 31′, [illegible] 16 horis post oppositionem rursum [illegible] igitur, quam die 24. [illegible] fuisset oppositio [illegible] fuisset latitudo quam 4° 31′ duabus [illegible], quam extra [illegible] [illegible] humilior. [illegible] Mars die [illegible] 10′ [illegible] [illegible]

periode Martis, multo perplexius est negotium, ... definire: et involvit magnum illud paradoxum ... anni 1593 Tychonis Brahe manu his verbis inscri...

Considerationem dignum est, quod Marti circa ... maximam latitudinem austrinam, et postea decrescit ... quasi quarta parte gradus propior eclipticae ... etiam correcto latitudinis maximae loco, in ... quomodocunque assumatur illic maxima latitudo: ... renda venit.

Postea cum ad ipsum in Bohemiam venissem ... ratione quaesivissem, illeque mihi, nodos in ... nem transire per punctum medii loci Solis, ... (de quibus sequenti cap. LXVII.) aliaque multa ... commonefactus de hoc negotio hoc inquit, est ... mas ante vel post oppositiones cum Sole; ... supra capite XV.

Causam quidem rei continet vera hypothesis ... stabilita: terminos vero maximarum latitudinum ... inquisiveris, quam Apollonius Pergaeus ... Quemadmodum enim in hoc negotio stationum ... qua noscatur locus stationum (est autem ... Terra eunte, parallelos manet sibi ...) ... calculo locus stationis a priori demonstratur ... causarum: sic etiam res habet in latitudine ... tunc quidem est latitudo maxima, quando ... vel decrescit eadem proportione, qua ... nationum Martis: et augetur latitudo, quando ... crescit, quam proportio linearum ... haec contra crescit. Vicissim ... distantia Martis a Terra quam ... vel quando distantia crescente, ... fiunt jam in oppositione ... inciderit, vel ante ... opera, probant ... fuit ... latitudo ...

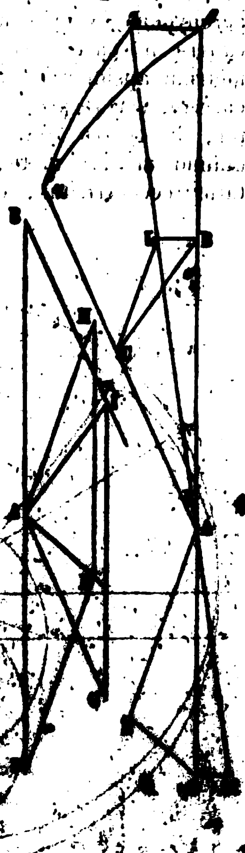
[illegible] falsa concepta imaginatione observationes confingere; etsi con- [illegible] est illi, qui paucas habuit observationes. Vide de hoc et [illegible]

[illegible] videamus, an calculus noster reddat latitudinem diei 10. Aug. [illegible] de 21. Julii et 25. Aug. ejus anni jam certi sumus. [illegible] observationibus calculus nititur, easdem et praesentat. Igitur [illegible] 18' 45' computatur eccentricus Martis locus in ecliptica [illegible] Sol 27° 37' 49" ♌ [illegible] ad Solem 5° 3' 29" angulus [illegible] et Mars ex ca[illegible] in 16° 3' ♓, cum observatus sit [illegible] 2° 10' 48" ♓, locus orbitae, distat a 16° 45' ♉ [illegible] inclinatio igitur erit 1° 46' 10". Ex hac et duobus dictis [illegible] cap. LXII. tradita invenitur lati- [illegible] 21' 14", duobus minutis etiam plus [illegible] observatio. Sed ne nobis insidietur [illegible] (quod vult methodus supra [illegible] veris Martis a Terra et a Sole, [illegible] veris angulis. In schemate vides [illegible] CL, LA. Et nostra methodus [illegible] CB ad BA, sed ut CL ad LA, sic [illegible] ad sinum anguli LCB. Sit [illegible] 18" ♓ Martis sub λ puncto [illegible] oppositus 27° 37' 49" [illegible] 1° 46' 10". Hinc et ex [illegible] CAL 5° 21' 36", cui respondet [illegible] ab A Sole. In triangulo [illegible] CA 101077 et AL 138261, [illegible] quaeratur LCA, qui invenitur [illegible] est 19° 27', cui [illegible] L Martis a C Terra.

[illegible] operationis invenio [illegible] 10", quam [illegible]

[illegible] hoc opere [illegible]

Fig. 128.



Caput LXVII.

Demonstratur ex locis nodorum et incli[illegible]ne pla[illegible] [illegible]ticae, consurgere eccentricitatem Martis [illegible] (seu Brahéo, ex centro epicycli Solis) [illegible]

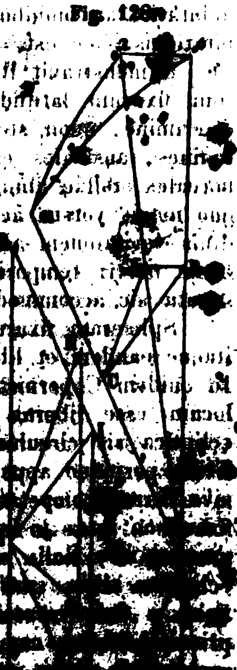
Ultima primis respondent. Disputavi cap. [illegible] bus solidis, non posse eccentricitatem planetarum [illegible] ipso centro Solis consurgere. Demonstrationem [illegible] vationibus deductam distuli partim in cap. [illegible] locis me satisfecisse puto vel [illegible] Primum per loca nodorum. Demonstratum est [illegible] eccentricitate ex ipso centro Solis, sive, [illegible] acronychiis ex oppositione planetae cum loco Solis [illegible] cadere in partes ex centro Solis oppositas [illegible] metrum apsidum et diametrum sectionis planetarum [illegible] currere, seu secare se mutuo in centro eodem [illegible] tur, in centro Solis scilicet. Quaeritur sic [illegible] utamur medio motu, num et hinc nodi [illegible] tatur eccentricitas, oppositis? Minime [illegible]



[illegible] est 100000: *ut igitur sinus totius anguli* ς *ad* β ς 3600, [illegible] β *ad* κ ς 2712. *In eadem vero dimensione, qualium* [illegible] *Telluris est* 100000, *semidiameter orbis Martis ex* [illegible] 152350. *Qualium igitur semidiameter orbis Martis est* [illegible] *erit* κ ς 1790, *ostendens in similem angulum* 1° 1′ 33″. [illegible] gradibus et scrupulis debuisset nodus evehens esse loco [illegible] posteriore, si male a me factum esset, quod pro β [illegible], Copernicano, [illegible]o, elegi κ centrum Solis. Vicis- [illegible] medium Solis [illegible] expensis et sic assumto puncto β, [illegible] hoc fit et si κ eligendum esset, oportet nodum evehentem ex β loco posteriori, deprimentem priori, sic ut semicirculus septentrio- [illegible] 2° 3′ 6″ curtatus sit.

[illegible], an hoc ita accidat. Capite igitur XII. crasse expensis ob- [illegible], Mars anno 1595. die 28. Oct. putabatur in nodo fuisse. [illegible] est locus eccentricus ex Braheanis aequationibus, quae ni- [illegible], in 16° 48′ ♉. Sic 1589. die 9. Maji mane ponebamus [illegible] altero descendente fuisse; tunc computavimus ex iisdem aequationibus locum Martis eccentricum 15° 44½′ ♏. Fit [illegible] dictum fieri debere. Uno gradu et 3½′ minus est in semi- [illegible]. Quodsi accuratius, ut cap. LXI, inspiciantur observata, [illegible] serius in nodum ascendentem [illegible] locum eccentricum accedu[illegible] [illegible] cadat planeta in 17° 38′ ♉ ascen- [illegible] curtatio superioris semicirculi est [illegible] proxime aequalis computatae 2° 3′, [illegible] punctum κ, repudiatur β. Nam [illegible] planorum non secabit diametrum [illegible] unde surgit eccentricitas, sicut [illegible] per causa esset? [illegible] per inclinationem [illegible] demonstratum, et per schema 100. [illegible] inclinatio, hoc est angulus LAB, quo [illegible] A Sole spec- [illegible]

Fig. 126[illegible]



[illegible]

parallaxin pro lubitu magnam, facile dilui [illegible]
At [illegible] ex documentis pluribus, [illegible]
magnam, [illegible] plane enervetur haec demonstratio [illegible]
capitis firmissime sit demonstratum cap. LII. [illegible]
ut non demonstraretur hoc thema ex [illegible]
hujus thematis, quod propriam habet cap. LII. [illegible]
parallaxis, ut cap. LXIV.

Utrum facias, perinde est. [illegible]
demonstrationes. Mihi haec via [illegible]
rerum ostenderem.

Caput LXVIII.

An inclinationes planorum Martis et eclipticae [illegible] et Ptolemaei seculo. Ubi de eclipticae [illegible] nodorum circuitu [illegible]

Dictum est cap. XIV, in unoquolibet [illegible]
inclinationem plani Martis [illegible] planum eclipticae [illegible]
dubitatio, an omnibus [illegible] eadem sit et [illegible]
bitationis haec est [illegible]

[illegible]monstravit Braheus tomo primo [illegible]
rum fixarum latitudines hodie esse alias [illegible]
discrimine, quod stellae boreales [illegible]
[illegible]dines, australes eas diminuerint, et [illegible]
boreales stellae diminuerint, australes [illegible]
quo magis versus aequinoctialia puncta [illegible]
dinis variationem [illegible]
[illegible] nostri temporis [illegible]
[illegible] sic accommod[illegible]

Sphaeram fixarum [illegible]
itaque [illegible] et [illegible]
Et eadem Copernic[illegible]
[illegible]

[illegible] dignitate ejus corporis, quod motum primo ceteris infert: [illegible] inveniuntur diversos et ad se mutuo inclinatos [illegible] circulos, [illegible] principiis, quae sunt explicata cap. LXIII. Procul dubio igitur [illegible] omnium circuli respiciunt hunc circulum regium ML a [illegible] Solis circa suum axem AE descriptum: et ad hunc [illegible] inclinationem constantis quantitatis, translatitiam tamen, [illegible] nodos transferri. Cum igitur et ecliptica sit unus ex planetarum [illegible] Solis [illegible] Terrae, consentaneum est, et hanc habere [illegible] inclinationem ad circulum regium ML, a circulo maximo corporis [illegible] inter [illegible] descriptum. Quid enim causae sit, cur ceteri planetae [illegible] declinent, sola ecliptica, Solari vel Terrestri itineri superstans, [illegible] cum hoc circulo regio ML coincidat?

[illegible] ergo concesso hoc, eclipticam proprie sic dictam inclinari ad [illegible] circulum Solarem, eaque repraesentetur nobis per circulum [illegible] delineatum, sintque ejus poli B, C. His obtentis, facile oc- [illegible] inveniemus, qua mutentur fixarum latitudines; quippe quae, ipsa vocis [illegible] vera ecliptica computantur, non ab illo circulo regio Solari [illegible]. Nam eclipticae vere et proprie sic dictae (quod tantum [illegible] contingant eclipses, sub qua Sol incedit) intersectiones seu [illegible] cum illo circulo ML, quem mediam eclipticam dicere posse- [illegible] non minus, quam nodi ceterorum planetarum: obliquitate [illegible] vel LK, quam metitur d[illegible] FB, GC, con- [illegible] manente, ut et in ceteris plane[illegible], si cen[illegible] F, G [illegible] constantibus, circelli scribantur, in [illegible] polos eclipticae [illegible] ponamus: tunc [illegible] et circulus [illegible] sedes pristinas in [illegible] G, deferet faciet[illegible] successu saeculorum [illegible] ut ubi [illegible] prope [illegible] fixa tandem limitem austrinum colle[illegible]. [illegible] sic erit. Limites K, H, non longe a fixis [illegible] sensibili aliqua variabunt earum latitudines. Nodi vero [illegible]

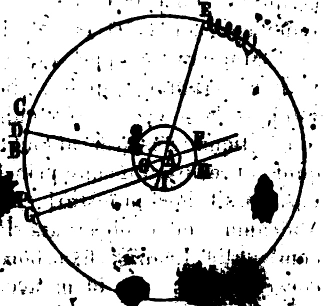
sim observatione stan[illegible] perimitur parallaxis [illegible]
Martis ordinari in perfecto plano, quod [illegible]
centro Solis.

Sed multo certius idem evincitur ex [illegible]
sitibus acronychiis, iis praesertim, quas observ[illegible]
dubias non reddidit. Hoc cap. XV. dici [illegible]
tuit. Anno enim 1587, cum Mars dista[illegible]
habuisset 4', latitudo ex 3° 37' fuisset [illegible]
nihil ultra 3° 37' inventam fuit. Anno vero [illegible]
a vertice 64°, si Martis parallaxis ex Solis [illegible]
$5\frac{1}{2}'$, tunc borea latitudo pro observata [illegible]
parallaxi. At nos computavimus nihil supra 1° [illegible]
servationi obvenire potuit: ut si Mars in altitud[illegible]
passus per 2' altius justo in borea appar[illegible]
et cap. XV. dictum. Anno vero 1602 [illegible]
observata latitudo 4° 10', neglecta [illegible]
praecise admodum. Sic anno 1604 non [illegible]
latitudinis borealis observatae. Igitur [illegible]
abstractione parallaxeos auctam.

Hisce tribus modis incertitudinem [illegible]
sibilitatem autem omnimodam non [illegible]
refractionis negotio et interdum observ[illegible]
dentibus. Itaque si quis Marti parallaxi[illegible]
tribuere velit, eum observata haec [illegible]
Accommodabitur enim et inclinatio [illegible]

[illegible] ...tibus fixas pristinas deserit et ad alias tran[illegible] H[illegible] tamen [illegible] ...cipimus, nodos Martis et nodos Telluris, [illegible] ...sectio- [illegible] hae orbitae cum illo circulo caeco LOI[illegible] non iisdem [illegible] in coelo circumferri, sed alios aliis esse celeriores. Hujus [illegible] positum [illegible]. Dum enim aequatorem constantem [illegible] ad caecum hunc circulum LOIM, ecliptica HK interim [illegible] ...tabilis [illegible] ...prehensa aequatoris a[illegible] declinatio [illegible] eclipticae [illegible], seu punctum, in [illegible] incidit recta e [illegible] polum corporis [illegible] ducta.

Fig. 131.



[illegible] spatio AB [illegible] 2', vel [illegible] alio, circulus minor, et sint B, C [illegible] borealis, sive puncta, in quae [illegible] corporis Telluris per [illegible] ejusdem Telluris ducta [illegible] tempore [illegible] ecliptica [illegible]

[illegible]

GI, paulo tamen vergens in consequentia (quia [illegible]
erat paulo [illegible] otior quam hodie), et continuetur [illegible]
scribatur, secans PO in F, et GI in H. [illegible]
major sit OF quam IH. Et ponatur polus [illegible]
ordinatur, hodie in F, olim in H. Erit hodie [illegible]
plani Martii ad eclipticam OF major, [illegible]
Martiae orbitae [illegible] us H, F circa A [illegible]
ex H in F. [illegible] e polus orbitae M[illegible]
iverit, seu in consequentia seu in ante[illegible]
eclipticae ab I in O circa idem punctum A, [illegible]
quievisse, quia IH et OF fere paralleli. [illegible]

Magnam quippe inaequalitatem motus [illegible]
si hoc verum est, polos singulorum planetarum [illegible]
tempore non eodem circumire. Nam et [illegible]
hinc aliqua nascitur anomalia, cujus [illegible]
quid sit consentaneum principiis hoc opere [illegible]
bus possit hoc praestari, [illegible]
Videamus nunc observata P[illegible]
cum [illegible] Leonis fixa boreali [illegible]
conse[illegible] idem accidisse [illegible]
illi[illegible] crevit, quia [illegible]

[illegible]

[illegible] Invent tamen longissima inductione per [illegible] ab [illegible] Aristotelis, non potuisse esse [illegible] in [illegible] ante Christi vulgarem epocham [illegible], cum [illegible] audiret Eudoxum, ut ex Diogene L[illegible] constat. [illegible] a Chaldaeis habitam Ptolemaeus nobis [illegible], [illegible] ante Christum 272 d. 18. Jan. mane, cum Mars [illegible] [illegible] occ[illegible]. Rursum hic nulla horae certitudo addita. [illegible] Ptolemaeus [illegible] habuit, dimensus astrolabio sid[illegible] Martis [illegible] tamen solum [illegible] sub zodiaco, sub ipsum [illegible] [illegible] motu Solis.

[illegible] tam [illegible] rerum maximarum argumenta capienda [illegible] possunt, imperfecta relinquenda astronomia. Primum enim [illegible] Ptolemaicae epocha motus medii ad fixas [illegible] [illegible] inquirenda, et [illegible] ejus cum hodiernis collatione [illegible]. Deinde per observationem Chaldaicam [illegible] eccentric[illegible] olim major fuerit quam [illegible] per Aris[illegible], si tempus sciretur, de [illegible] tempore [illegible] posset.

[illegible] per Deum immortalem! [illegible] in controve[illegible] [illegible]

nihil est negotii, per quotidianas Solis declinationes [illegible]
ejus elongatione a puncto, quod Sol tempore [illegible]
cunque illo, aut in quacunque sphaera statu[illegible]
gotio sphaeras deputarunt, cum post octavam [illegible]
constitutam sphaeram alii decimam, recentissimi [illegible]
vanissimis speculationibus constituerint, [illegible]
vehementer increpuit. At quid in [illegible]
nunquam dixit nec scriptum reliquit [illegible]
judicat) [illegible]lite et festive, (ut ego) [illegible]
[illegible] quaesivit id punctum in ipso globo Telluris, [illegible]
[illegible] quolibet seculo certum [illegible]
hujus loci non est prolixius ista discutere. [illegible]

[illegible] III. Sequitur demonstratio aequationis [illegible]
observatis in principia cardinalium signorum [illegible]
[illegible] loco Solis subtracta vel addita, [illegible]
[illegible] puncto, quod Sol aequinoctii tempore [illegible]
de [illegible]tationis quantitate [illegible]
vel principio zodiaci. [illegible]
[illegible] Hipparchus demonstra[illegible]
[illegible] satis justa, cur [illegible]
[illegible] firmatam [illegible]
[illegible]

[illegible] ressum Solis in Cancrum insensibilis plane sit. Neque [illegible], Hipparch[illegible] et Ptolemaeum in ipsum hujus in-[illegible] [illegible], neglectis punctis intermediis. Credo facilius, [illegible] eorum aestatem in notandis Solis declinationibu[illegible] semper-[illegible] utroque latere solstitii, comparasse invicem [illegible] tempus [illegible] momenta intermedium pro vero ingressu Solis [illegible], quo posito, si vicinis solstitio locis comparatio fuit [illegible] quidem erroris, tantum tamen committi potuit, quantus est [illegible] in quo abeunt 15′ de motu Solis. Igitur etsi certis-[illegible], potest tamen circa solstitia in partes alternas deesse [illegible] Solis quarta pars gradus, et apogaeum tunc 8° ante-[illegible]. Hactenus de motu Solis.

[illegible] ipsius observationes attinet, etsi demus, astrolabio [illegible] Ptolemaeum [illegible]: tamen adhuc non constat certius [illegible] (ut in quo prius et locum Solis consideravimus) [illegible] locis; et si committit Ptolemaeus errorem in as-[illegible] elongatione a puncto [illegible], idem error commit-[illegible] Atque [illegible] quidem elongatio [illegible] Arietis [illegible] Solis elongatio [illegible] erroris [illegible] enim et modum [illegible] inquisivit illam Ptolemaeus [illegible]

[illegible]

Etsi vero haec disputatio de 30' nihil [illegible]
medium, siquidem his 4 vicibus [illegible]
possit neglecto puncto aequinoctii, [illegible]
superius cap. XVII. inquisivi aphelii locum [illegible]
adhuc [illegible] tenemur, quod Martis loca [illegible]
loci Solis reducenda sunt; quod opus nunquam [illegible]
cum Martis tum Solis a communi puncto aequinoctii [illegible]
aliter, nisi per haec quasi elementa, [illegible]
Sole arcus. Quodsi ad momentum, quo vera [illegible]
sitio, planeta videatur ultra vera Solis loca 30' [illegible]
est, inaequalitate secunda, nondum idoneus ad [illegible]
qualitatem. At in apogaeo haec 30' [illegible]
magnum arcum eccentrici, qui major adhuc [illegible]
medio respondet. In perigaeo fit contrarium [illegible]
resis parvum arcum eccentrici, cui minor [illegible]
petit. Qui ergo dicit, Martem his 4 vicibus [illegible]
ulterius, idem dicit, Martis motum medium [illegible]
apogaeo multis, in perigaeo [illegible]

[illegible]

... summa 1° 20', quibus indicatur, 7' deberi horas 2. 6', visus in 2° 36' ♐.

Tempora igitur composita ista:

					Loca
[illegible]	Tybi	XXVI.	Hora	5. 0	21° [illegible] II
[illegible]	Pharmuthi	IV.	„	15. 39.	29. [illegible] ♌
[illegible]	Epiphi	XII.	„	7. 54.	2. 36. ♐
[illegible]	4. dies 68.		Horae	10. 39'	68° 23'
[illegible]	4. dies 97.		„	16. 15.	93. 6.[109]

... intervallo primo motus medius a fixis ultra integras ... secundo 96° 16' 24". Illic vero apparens motus ... integras periodos 68° 21' 20", ablata praecessione temporis ... illo seculo. Hic vero ... 93° 2' 20".

... hypothesis hactenus investigata et constituta ex ... et quaeritur, quo loco anomaliae respondeant ... in eccentrico ... quantos jam dixi. ... deprehenditur: si tempore ultimo ponatur aphelium ... reliquis temporibus ob praecessionem aequinoctiorum ... tempore anomalia media 46° 37', secundo ... longitudo ab aequinoctio tempore ... stellam ... referri per hypothesin ... in 21° 7' II, secundo in 29° ♌, tertio in 2° ... ♐, ... Ptolemaeus plures ... quam tribus enim ... hoc ... capite XVII.

... Ptolemaico, ...

loco anteriori; ultima prius incidit [illegible]
loco posteriori.

Ecce: Tybi	XXVI.	h.	[illegible]
Pharmuthi	IV.	h.	[illegible]
Epiphi	XII.	h.	[illegible] 37.
Intervalla	[illegible] dies 68.	h.	6. 30 [illegible]
Aegyptii	[illegible] 97.	h.	12. [illegible]

Primum temporis intervallum factum est [illegible] illi per 5′ 15″ minor respondet, ut sit 90 [illegible] vallum rursum effectum est minus, quare [illegible] minor per 5′ 40″, scilicet 96° 10′ 48″ [illegible] mediae minori respondet major motus [illegible] eadem anomalia utrinque, motus apparens [illegible] igitur descendendum ab aphelio. Attamen [illegible] nisi magno descensu facto, secundum [illegible] si indulgeremus inquisitioni, et non [illegible] nam, gigneretur omnino [illegible] vicissim si certissimae essent [illegible] [illegible] nascerentur apogaeum [illegible] [illegible] autem 36° ab [illegible] 0° 3′ ♀ et sic accommodata [illegible] medii [illegible] longitudo [illegible]

[illegible]

Tertia 2. 37. [illegible]

[illegible] tam certas fuisse observa[illegible]

[illegible]

[illegible] 27' ♌ differentia 9½'. Ut haec obliteretur, manere debet [illegible] motus medius debet omittere 3½'. tunc prodibit

[illegible] 21° 4' ♊ ... Debuit 21° 7' ♊ ... Differentia + 3'
[illegible] 29. [illegible] ♌ ... 29. 31. ♌ ... + 2½'
[illegible] 2. [illegible] ♐ ... 2. 36. ♐ ... + 2½'

[illegible] eadem continget mutatio casus secundi, si eccentrici-[illegible] et longitudinem simul mutaverimus.

[illegible] autem et eccentricitatem Solis et apogaeum simul [illegible], conjunctis casibus tertio et quinto, erunt fundamenta ista:

[illegible]	XXVI. h. 9. 0'	Loca 21° 4' ♊		
[illegible]	IV. „ 19. 30.	„ 29. 27. ♌		
[illegible]	XII. „ 8. [illegible]	„ 2. 40. ♐		
[illegible]	d. 65. h. 10. 30	68° 23'		
[illegible]	„ 97. „ 8. 0.	„ 93. 13.		

[illegible] intervallum primum, ut casu primo; mutatur ultimum per- [illegible] tempore plus itineris peractum, descendendum [illegible] proinde. Horis quidem 8 de motu medio respon- [illegible] adde excessum itineris 8. Ita colliguntur 13½', [illegible] per 1° 12' retrogerimus, ut sit ultimo tem- [illegible] et anomalia media [illegible] 45'. Motus igitur medius [illegible] 11 [illegible] ♐. Hinc computatione:

[illegible] 21° 8' [illegible] ♊ ... Debuit ...
[illegible] ♌ ... 29 [illegible] ♌ ...
[illegible] ♐ ... 2 [illegible] ♐ ...

[illegible] tribus, quae ex Ptolemaeo sumseramus, mutu[illegible] effectus ex casibus [illegible] secundum.

[illegible] motus medii [illegible] non mu- [illegible] eccentricitate Solis neque apogaeo neque utroque simul [illegible] Nam casus [illegible] 30". [illegible] 2' 30". Solum [illegible]

1. Januarii [illegible]

sentaneum est casui quinto, uti diximus, [illegible]
Ptolemaei (quae competit in 5° ♓) [illegible]
fieri 20′ minorem, itaque Solem pro 3° 3′ ♓ [illegible]
refractionis universalitate per omnia loca [illegible]
dictum, et stante hac observatione, argumentum [illegible]
eccentricitatis Solis, quam putabatur a Ptolemaeo [illegible]

Neque te moveat, quod refractionem dixi [illegible]
tantum 20′. Nam si bene perpendas, cum [illegible]
igitur tunc 1° ♓ Alexandriae, et sic Sol in [illegible]
plurium altitudinem; minorem igitur refractionem [illegible]
simpliciter in longum porrigebatur. Itaque [illegible]
fuerunt hae duae causae se mutuo conficientes [illegible]
putabit hanc 10′ differentiam, si quis in [illegible]
satus. Verbi gratia: inter cor Leonis et [illegible]
dit intervallum 54° 10′, quod est non majus [illegible]

Sequamur igitur quorum nos vota [illegible]
casu primo, anno 2. Antonini, die [illegible]
Aegypto, motus medius Martis ab aequinoctio [illegible]
congruit anno Christi vulgari 139 [illegible]
inter [illegible] et Alexandriam [illegible]
geographica. [illegible]
medius motus [illegible] 11° [illegible] 30″ [illegible]
dinem 2° 30′ [illegible] hoc est [illegible] 30′ 0″ [illegible]
fuit a corde Leonis [illegible] 8 [illegible]
fuit motus medius Martis [illegible]
ab eodem abfuit demonstrante Brahe [illegible]
fuit a corde ♌ [illegible]

[illegible]

1590 [illegible]

[illegible]

[illegible] igitur medius praecedebat cor Leonis 5ˢ 1° 47′ 0″. Sed [illegible] Februarii h. 3. 30′ Huennae fuit medius Solis 12° 47′ 41″ ♓, [illegible] 15′ 30″ ♌; Solis igitur medius praecedebat cor [illegible]. Annis 1460 Aegyptiis desunt 9° 40′ 49″. Colligimus [illegible] 2′ 42″ minus quam ex Prutenicis, eritque epocha in radice [illegible] in meridie 5ˢ 7° 14′ 36″ a corde Leonis. Similiter [illegible] Solis invenitur 8° 23′ et in radice Christi 1ˢ 27° 48′ 0″ [illegible]

Caput LXX.

[illegible] Ptolemaei observationum consideratio, pro exploranda [illegible] et orbium proportione tempore Ptolemaei.

[illegible], quod non semel monui, Ptolemaeum longe plures adhibuisse [illegible] quae relatae sunt in ipsius opus. Ecce enim, ad tra[illegible] investigandae proportionis orbium utitur observatione [illegible] triduum vicina ipsi oppositioni. Dictum autem est [illegible] observationes tam vicinas [illegible] quippiam peccare, nisi vel [illegible]. Sequamur tamen ipsius vestigia, et hypothesi jam [illegible] primi fundamentis inaedificata, computemus et hunc [illegible]

Epiphi 12.	h. 8.	Anomalia	130° 37′ 30″	
15.	h. 9.			
[illegible]	3.	h. 1.	Motus medius	1. 35. 39
123 45 54			Anomalia	132 18 9
[illegible] 50			Distantia	138000

[illegible] 21. 30′ [illegible] horae [illegible] 29′ 40″ [illegible] 131 [illegible] opposito [illegible] 44″ [illegible] 45′ [illegible]

facta fuerit una hora ante, nimirum aurora [illegible]
quae est Huennae hora quarta, a qua ad [illegible]
hoc intervallum temporis ex fundamentis super[illegible]
tus Solis superasse cor Leonis 5s 25° 32′ 50″ [illegible]
aequationem habens ex Ptolemaeo 2° 0′ 30″ [illegible]
jectitiam: distantia Solis a Terra illic 98790 [illegible]
motus Martis tunc superavit cor Leonis 2s [illegible]
lium 3° 48′ 20″ sit ante cor, erit anomalia Martis [illegible]
quata 60° 15′ 27″, distantia 158320.

Hinc gemina via perveniemus ad finem calculi [illegible]
citatem et aequationem Ptolemaicam. Tunc long[illegible]
est 5s 27° 33′ 20″, differens a longitudine Mar[illegible]
per 4s 0° 58′ 13″, qua distantia [illegible]
a Sole ostenditur apparens elongatio a Sole [illegible]
parens elongatio Martis a corde Leonis 3[illegible]
per Braheanam eccentricitatem et aequationem [illegible]
ponantur, Solis locus apparens [illegible]
5s 27° 15′ 44″, quare et angulus commutationis [illegible]
quam et distantiam Solis a Terra [illegible]
ostenditur apparens elongatio Martis a corde [illegible]
ferentia inter utrumque calculum [illegible]
Mars videbatur, quasi [illegible]
Scorpii, ut [illegible] observationis [illegible]
cor Leonis in 2° 30′ ♌, borealis clara fronti[illegible]
per 3s 3° 50′ 0″; Braheo cor Leonis [illegible]
27° 30′ ♏, elongatio 3s 3° 20′ 0″ [illegible]
computata 3s 4° 51′ 28″. Differentia [illegible]

Ptolemaeus [illegible] observationi [illegible]
antiquitatem [illegible] procul dubio [illegible]
adhuc inveniamus [illegible] et [illegible]
servatio. Nam in modo medio ad [illegible]

[illegible]

[illegible] claram frontis, quam Braheus recte secundae magnitudinis [illegible] Ptolemaeus subintellexit, borealem frontem [illegible] locutus est, dum pro clarissima borealium [illegible] dixit, quae borealissima non fuit? Multo igitur [illegible] quae quinta numero est, ab observatore [illegible] [illegible] consentit mea computata longitudo Martis cum hac, [illegible] et hoc manente hypothesi, quam hodiernae genuerunt ob- [illegible]. Nam Braheus illam borealissimam reponit in [illegible] cor Leonis, in 24° 17′ ♌, restabit illi elongatio a [illegible]. Noster calculus vero Martem refert in elongationem a [illegible] vel 94° 51½′. Differentia 3′ vel 5′, non major, [illegible], negotium mihi exhibitum esse a latitudine, dum expendo [illegible] προστεθεικέναι, quasi diceret: Videbatur ita prope accessisse, [illegible] una quasi stella haberi possent, ut viderentur se mutuo tangere. [illegible] vertit cooperuisse, quasi scripsisset Graecus ἐπιπροστεθεικέναι, [illegible] Opticis fol. 321 usus sum voce „superpositum.“ Germani propriis- [illegible]. Ex hoc ratiocinabar ita: sive subtercurrerit centraliter, [illegible] boream austrinamve raserit, non potuisse ab ipsa distare [illegible] magna aliqua portione; minus namque incertas esse latitu- [illegible] longitudines, quia constantior et simplicior est earum ratio, ut [illegible] est. Jam scimus, nodum retrocedere a fixis spatio [illegible] 4° 15′, ut probatum cap. XVII. Ptolemaeo fuit existi- [illegible] antecedere 3½° cor Leonis. Nobis per intermedios [illegible] gradum retrocesserit; ut tempore observationis fuerit 2½° [illegible]. Ergo nodus 87½° post cor Leonis. Sed Mars per [illegible] cor Leonis, ergo abest 31° a nodo, inclinationem faciens [illegible] parallaxin orbis efficitur 1° 7′ justa latitudo. Jam vero [illegible] latitudinem clarae frontis esse 1° 5′, borealissimae [illegible]. Itaque latitudo videbatur me convincere de clara [illegible] hanc a Marte tectam fuisse, non illam.

[illegible] comparatio numerorum. Nam in latitudine borealis- [illegible] Braheus et Ptolemaeus, cum pronunciantes; ille [illegible] latitudine [illegible]. Ptolemaeus habet [illegible]

[illegible]

sint tres stellae in forma trianguli; Mars spectatus ... *oppositus fuerit boreali fronti* Scorpii, factus ... earum, quae sunt in boreali parte frontis Scorpii ... tationem facit et hoc, quod non dixit observator ... *fronti*, quod non sonat de una singulari stella ... integrae.

Nihil igitur juvant nos hae duae antiquae ... dam vel latitudinem vel orbium proportionem ... nihil nos impediant observationes contrariae ... verisimilitudo, concludamus, eandem esse ... quae fuit olim, latitudines vero maximas ...

COMMENTARIA DE MOTIBUS MARTIS

NOTAE EDITORIS.

tare studens, cujus sensum non percepit, et sic [illegible] te decet, in posterum agas peto, neque propter male [illegible] nationem tuam et mentis tuae obscuritatem, ut veri[illegible] simul forte mei contemtum quaeras. Apologiis et [illegible] sincero et amico pectore, ad veritatem et justitiam [illegible] observ[illegible]ssimus semper fuit, ubique directo.... [illegible] potius nimia quam ullo Attico splendore, quo math[illegible] video et simul epistolae modum excedi, finem hic facio, [illegible] nostrae professionis κοινωνίαν rogo et hortor, ne [illegible] hac innocenti mea responsione arripias &c.

3) p. 85. Verba haec comparata cum iis, quae [illegible] chonis haeredes ortis p. 12 s. diximus, his [illegible] locum succe[illegible] 500 [illegible] saepius vero [illegible] Haered[illegible] summam, majoremque efflagitabant. [illegible] misit, quare ad edenda patris oper[illegible] ab Imperatore constitutum, segnitatis accu[illegible] quoque consiliariis visa est, ut molestos [illegible] collegas, satisfacerent, qui rem parum pe[illegible] ducebat. Keplerus contra pro eruditio[illegible] adspectu cognoscens simulque Rudolphi [illegible]

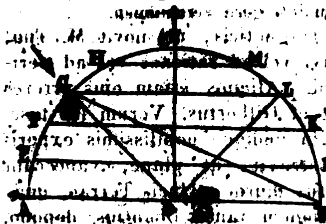
[illegible]

[illegible] sonderbar nit verziert. Ich [illegible] judicium, [illegible] daran [illegible] vermeint, gern [illegible].

[illegible] (d. 12. Jan. 1603): In magneticis, [illegible] novit M. Tua, [illegible] experimenta pleraque examinavi vel [illegible] ad [illegible], quantum informi lapide potui. Aliquos etiam ejus [illegible] [illegible] nominatim alicubi taxat et Gilbertus. Verum [illegible], [illegible] tractavit hanc rem Gilbertus, ita undique nobilissimis experi[illegible] [illegible] contradicentium ora obstruxit, ut plane evanescant [illegible] illa migratione poli motus diurni [illegible] locis Terrae, quae [illegible] subjecta. Quam speculationem tanto libentius depono, [illegible] ante 200 annos observatam altitudinem poli [illegible] [illegible], quae [illegible]. (Comp. Ep. ad Maestl. p. 54.) At [illegible] Antonio [illegible] (comp. Vol. II. p. 320) mihi monstrati, [illegible] [illegible] [illegible].

[illegible] ubi plus [illegible] jam maligna inhaerenti memoriae, [illegible] mea [illegible] ex eo animi gratia delibavi. Si qua [illegible] M. T. communicabo. In praesens ista [illegible] V[illegible] [illegible] obstare, quod montana regiones [illegible] [illegible] habent [illegible]. De declinationibus (lib. [illegible]) mihi ex[illegible] [illegible] experimenta proponit, ubi [illegible] explicata [illegible] [illegible]

Fig. [illegible]



[illegible] ergo area AEB ad aream ACB, ita [illegible]

Videmus, ait Gilbertus Lib. V. cap. [illegible]

aequatorem. Sit in G, linea [illegible]

AG 45°, erit ABG $22^{1}/_{2}$°, igitur [illegible] A in G

[illegible] G, L [illegible] D. Et quia LDG [illegible]

quadrati. Jam sector GDE est pars [illegible]

[illegible] Subtracto triangulo GLD [illegible]

[illegible] Est vero integrum [illegible]

[illegible] Videlicet [illegible]

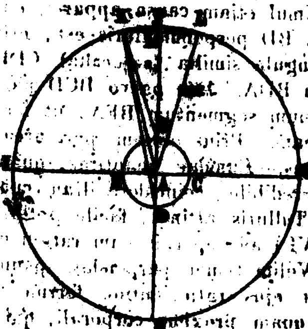
[illegible] 112 [illegible] 180 [illegible]

[illegible]

[illegible] proportione ea, qua dividitur AC, [illegible] virtutis, per-
[illegible] si [illegible] sit in C, totus axis stat [illegible] ab uno polo/
[illegible] Cum ergo nihil absit a polo C, totaliter a C dirigitur ad
[illegible] quia nulla est proportio remotionis poli A a versorio
[illegible] poli C. Ita [illegible] patet, cur [illegible] distantiae ab
[illegible] alludat ad mensuram. Simul etiam causa apparet, cur
[illegible] media. Nam quia BD perpendicularis est, erit
[illegible] BD ad DA, et cum sint triangula similia [illegible] CDB
[illegible] DA sic area CDB ad aream BDA. Jam parvo BCD par-
[illegible] et magno BAD magnum segmentum BFA, ut fere
[illegible] CDBC, ut AD linea ad CD lineam. Prius autem per areas
[illegible] per lineas sum operatus. Cumque quantitas, quae
[illegible] vertetur, rursum est credibile, coincidere illam cum
[illegible] Quod autem ad motum Telluris attinet, facile poteris
[illegible] probationum, quas ille (lib. VI.) ad Copernicanam rationem
[illegible] et ipse sim. Velim tamen perpendas, ipsum
[illegible] Haec enim fere est ejus ratiocinatio: ferrum a
[illegible] movetur virtute aliqua quam proxime corporali, quia
[illegible] Quidni ergo et Tellus ipsa moveri possit a virtute
[illegible] id moveri quod naturaliter habet motum circula-
[illegible] habet polos naturales, [illegible] aequatorem
[illegible]

et [illegible] sufficienter demonstraverunt. [illegible] conjicitur ad hunc modum. Sit in sphaera [illegible] seu [illegible]; polus [illegible] eclipticae [illegible]

Fig. 485.



cedentia, [illegible] positionem [illegible] versus [illegible] centro A, polo [illegible] 22° 42′ (quantum [illegible] scriptum [illegible] protrac[illegible] in [illegible] versus [illegible] [illegible] quod ab [illegible] est [illegible] 24° [illegible]

poli [illegible] [illegible] declinationem [illegible] AK 23° 42′; AK [illegible]

[illegible]

[illegible] Kepleri regna haereditariis intercedat, denique sententiam [illegible]

[illegible] ich [illegible] geschrieben, hab ich sein Schreiben [illegible] Wochentahlen [illegible] gefunden [illegible] communiciret [illegible] wenig habe, hat es doch [illegible] (von dem die astronomische Jahrzahl [illegible] für den Salmanassar König in Assyrien helt, [illegible] Babylonische Monarchia under Nabonassar [illegible] kann ich nit angeben.

[illegible] keines mir sonderbar Bekannten, die [illegible] in seinem [illegible] zu erinnern, ausser dass mir der Herr Bernegger von [illegible]. Da ich dem Herrn durch diesen kann [illegible]

[illegible] viel mehr über [illegible] Martis ist man mit grossem Verlangen [illegible]

[illegible] des Gilberti Buch de Magnete dem Herrn [illegible] sein; dann ich hab es noch keiner so weit penetriret. [illegible] kann ich doch nit umgehen, [illegible] Gilbertus de [illegible] Terrae motu [illegible] das Buch de Magnete, [illegible]. So ist nit ohne, dass [illegible] Epicycli [illegible] Ich kann aber [illegible] Hypothesis [illegible]

[illegible]

[illegible] quare tantam inter [illegible] [illegible]
[illegible] utilis esse possit.

[illegible] Copernici [illegible]
[illegible] unius sphaerae fixarum. [illegible]
[illegible] exemplo simile in natura, ubi [illegible]
[illegible] ad reliquum corpus [illegible]
[illegible] diameter [illegible] (Solis) [illegible]
[illegible] loci in quo motus [illegible]
[illegible] temporibus existat non major [illegible]
[illegible] plurimum 1 et 2′, itaque evanescet [illegible]
[illegible] vacuum; moventur [illegible]
[illegible] vero vacuum a Terra [illegible]
[illegible] naturae disquisitum; proponebam [illegible]
visam ab iis, qui Nordwagiriam oceanum [illegible]
[illegible] longam; comparavi ego ad animalculum, [illegible]
[illegible] agit. Apparuit, proportionem [illegible]
[illegible] quaerendam [illegible]
[illegible] elephantis [illegible]
[illegible] et inepta. [illegible]

[illegible]

[illegible] ab ipso Ptolemaeo facta est, ut refert, anno [illegible] [illegible]

[illegible] hoc, quem dicit mysticum, in [illegible] In „Supplemento Ephemeridum" (Ges. [illegible]) [illegible] supputavi, cum multoties expertus fuissem, [illegible] proportionalia et excessum priorum; itaque ordinavi pro [illegible] quibus ordine primo habentur aequationes centri, in secundo [illegible] maximae. In tertio ordine reposui numeros [illegible] dictis ingeniose colligitur pro dato situ [illegible] maxima, absolvere possimus planetarum calculum &c.

[illegible] quaerenti Petro Crügero (Dantiscano, professori math.) haec [illegible] deprehendi fortuito, postquam ipse eodem sub alia [illegible]. Est nihil aliud, quam ex divisione differentiae [illegible] quotiens in singulares et breves numeros translatus, [illegible] 101500. Differentia 28060

Summa 174060

[illegible] continuata si dividatur per summam, quotiens erit [illegible]. Jam complementum anguli [illegible] in hunc quotientem, abscotis 5 [illegible] complementi [illegible], ut prodeat [illegible] quotientem 168667 liceret „mysticos" appellare [illegible] appellandus [illegible]; vel si, ubi prodit 100000, [illegible] prodit 200000, [illegible] appellaretur [illegible] et sic [illegible] litteris d. Linzii anno 1624.)

[illegible] addit Keplerus, [illegible] velit, [illegible] (in mortem Tychonis) habita est a D. [illegible] Tychonis Brahe" cum carmine Kepleri (Ges. Op. V, 4[illegible]) [illegible]

[illegible]

[illegible] apparere, rem minime levem hic attigisse Fabricium, [illegible] (84) [illegible] p. 85, quantam [illegible] (84) [illegible] 127. Filius Io. Fabricii Johannes [illegible] Keplerum per literas (d. d. 11. Mart. 1608) [illegible] verbis [illegible] „Vidi apud parentem [illegible] quamvis descriptam [illegible] tamen vidi et ipsemet expertus sum [illegible] cujus rei periculum feci in observationibus [illegible] nis desumtis, dum in patria moramur. [illegible] sic habet.“ [illegible] agnoscit [illegible] una cum calculi probatione [illegible] et in astrologicis datur facilis via ad [illegible] rerum, quae omnia mutila et manca sunt [illegible] autem meum inventum reticere de vera tempestatum [illegible] modum ad parentem transmisi, qui illius veritatem [illegible]

[illegible] Keplerus [illegible] 1608 [illegible] D. Quas ad me dedisti literas [illegible] temporis inciderunt [illegible] privignam enim elocabam et nuptiarum [illegible]

[illegible]

[illegible] In editione „Scholarum mathematicarum" [illegible] anno 1599 typis excusa, verba haec Rami [illegible] intelligentum haec addimus: Ramus in libro I. agit de [illegible] artis dignitas intelligatur." Cum vero mathematicas [illegible] Ramus libro II. has opiniones ex animis hominum [illegible] philosophorum placita congerit. Utilitatem mathematicae [illegible] astrologia") demonstraturus, quid, inquit, astrologia [illegible] numeratio motuum coelestium, quam geometrica globorum [illegible] Astronomiam, queritur, plurimis esse einvolutam et impeditam hypothesi[illegible] per mathematicam liberari possit. „Inde ab Aristotelis aetate [illegible] non contentam observationibus, causas motuum &c. [illegible] Eudoxum [illegible] orbium revolventium reperisse, quas Aristoteles et Calippus [illegible] Pythagoraeos epicycles et eccentricos orbes induxisse. [illegible] nostra [illegible] non antiquis solum comparandus sed in astrologia praesus [illegible] hypothesium, rejecta hypotheses illas admirandas revocavit, quas [illegible] ex Terrae motu demonstrarant. Veruntamen astrologi et [illegible] novi [illegible] ad hypotheses compositis astrologiam perinde [illegible] veterum Babyloniorum, Aegyptiorum, Graecorumque etiam [illegible] fuisse, et ab ea coelestium corporum motus [illegible] praedictionem [illegible] posuit, hypotheses ideo necessitate ulla inventas esse." Commentum igi[illegible] verba de passione regiae professionis Keplerus jam pridem Maestlino [illegible] (Vol. I. p. 24 s.).

[illegible] ad Copernici opus dictum est Vol. I. p. 245 et 286.

[illegible] hoc poemate Tycho primam partem libri sui de stella nova, [illegible] hujus libri, in qua de restitutione Solaris unaque Lunae curri[illegible] accurata rectificatione affatim actum est, finem imponimus. [illegible] ad artis hujus alumnos carmine, colophonis loco apposito, [illegible] [illegible] pertractationem, jam tandem transibimus." Consuevit [illegible] immiscere carmina, quae passim occurrunt in libris [illegible] et [illegible] (Vita Tychonis).

[illegible] opere inscripto: Astronomiae instauratae Progymnasmata [illegible] folio, quod exhibet inscriptionem, depicti sunt vir et puer, quibus [illegible] Despicio." Item in [illegible] Tychonis quibusdam [illegible] Kepleri inscriptio poematis [illegible] testatur, pro symbolo [illegible] hominum" &c. Keplero fuit pro symbolo. In collec[illegible] publici juris fecit, quaerit Rothmannus (p. 89) quid haec verba [illegible] paginae parte inferiori binas imagines, alteram astronomiam, [illegible] appellas. Quas cum diligenter intuebar, animadverti ab [illegible] circa astronomiam quidem „suspiciendo despicio" circa [illegible] Diu haec cum admiratione considerans cogitavi, hiero[illegible] artem spagyricam [illegible] totius naturae et mundi [illegible] [illegible] ut quae natura agit per [illegible] per [illegible] sidera." &c.

[illegible] haec esse recte [illegible] [illegible] et inferiorem [illegible] sed etiam [illegible] Prima [illegible] physicam [illegible] ita [illegible]

[illegible]

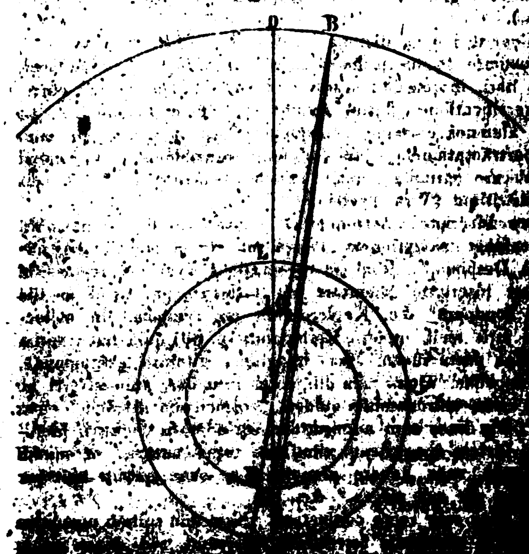
[illegible] Kepleri conatus, [illegible] ad [illegible] [illegible] que minus observationum [illegible] Tengnagelii ad lectorem, plane aliqu superfluum [illegible] [illegible], qui alias „impedire [illegible]" [illegible] Tengnagelius haec conscripserit, non [illegible] [illegible] 1608, quo Archidux Matthias in [illegible] [illegible] ingressus est, et Tengnagelius, [illegible] [illegible] res transigebat politicas. Comp. Vol. II, [illegible]

10) p. 151. De Lunae „virtute tractoria" Keplerus [illegible] [illegible], respondens ad quaestionem hanc [illegible] [illegible] ich von niemand anderem als dem Herrn [illegible] [illegible] tanquam lydium lapidem meine Zuflucht genommen [illegible]

Ferner bitt ich Ine, mich zu berichten, ob [illegible] [illegible] habe. Dann obwohl P. Nonius multa ingeniose [illegible] [illegible] ab ejusmodi atque fundamentis anfangend [illegible]

Ueberdiess ist mir rationis hypotheseon zu Gemüth [illegible] [illegible] auf ein Weg, den ich nit anderwerts meines [illegible] [illegible] etwas glaubwürdiger und den [illegible] [illegible] des Herrn Meinung hören wollte.

Fig. 1[illegible].



[illegible] pastam erit, occasiones [illegible] circumspicere. (Spectat [illegible]). Altera epistola d. 16. hujus [illegible] Quo minus mirari debes [illegible] meam manum, nisi confuse [illegible] navigandi sollicitus hactenus non fui, quippe [illegible] nium quidem legi, qui quidem exstabat in [illegible] tamen, prodiisse non ita pridem H. Grotii [illegible] natura Gilbertus doctissime scripsit. De longitudinibus [illegible] in mediis undis addiscendis G. Nautonnier Sieur de Castel[illegible] splendidissimas proponit speculationes. At ne irrita [illegible] manu versantibus, valde vereor. Vocem enim, e continenti [illegible] profectam, palinuri medios inter fluctus oceani non facile [illegible] haec componere possint. Vidi et Germanum aliquem, qui in [illegible] nautico more exornato, descriptionem exhibuit [illegible] Baltici et oceani Germanici, Aquitanici, Cantabrici, [illegible] fluxus maris accurata continetur explicatio ceterorumque [illegible] auctoris excidit.

[illegible] de hac re in Fr. Patricio inveniuntur: quamvis is [illegible] excludere conatur a consideratione causarum. Ex [illegible] est haec speculatio: a Luna maria sic attrahi, ut [illegible] attrahuntur a Terra. Terra quidem fortius attrahit, [illegible] in aërem descerentia Terram, sed [illegible] omnibus versus torridam, ut ibi ejusque [illegible] eo momento superficies oceani [illegible] quia ad latus posita. Luna [illegible] litorum Americae sequi non possint, [illegible] superficies [illegible] autem non ad aequilibrium [illegible]

[illegible]

[illegible] Keplerus) ad eandem [illegible] — [illegible] continent, nondum perspexi. Jam in se [illegible] [illegible] Keplerus. Reliqua, quae [illegible] Keplerus in [illegible] literis, [illegible] quaestionum [illegible] [illegible] ad [illegible] Aprilem mensem 1607 [illegible] [illegible] et Terrae Copernicana für mich [illegible] [illegible] geschrieben, darauf habe ich keine Antw[illegible] [illegible] würde, ich wolt aber doch gern die [illegible] [illegible] Maii 1607).

Cum [illegible], scripsit Keplerus, qua ratione [illegible] [illegible] literis praeteriverim, incidit [illegible] [illegible], per quod mecum agis [illegible] [illegible] me in Tuis literis prioribus [illegible] [illegible] tunc nullum videre potui. (Schema [illegible]) [illegible] ad quaestiones Lunares [illegible] [illegible], ut [illegible] inter Lunares [illegible] [illegible] obscura est sententia, dicam [illegible] [illegible]

Sic Tu: quia DFB = DCB, hinc colligit C[illegible] [illegible]. Hic ego dico primo, si esset possibile, [illegible] [illegible], cum quo F Sol videtur conjungi, sic ex [illegible] [illegible], sive sensibilis [illegible] [illegible] a B in D, illi [illegible] mihi [illegible] [illegible] F [illegible].

Atque, etsi propter Solis [illegible] [illegible] si viderentur [illegible] [illegible] mechanicis, tamen [illegible] [illegible] Nam [illegible] Solis [illegible] [illegible] punctorum [illegible] B, D, [illegible] [illegible] Terra [illegible] [illegible] DCB [illegible]

[illegible]

[illegible] Sol in eodem concentrico cum [illegible] et in [illegible] ejusdem [illegible] volvuntur. Nam etsi tunc centrum [illegible] [illegible] tamen quodammodo fieret comprehensibile, eo [illegible] quod [illegible] EG, HI lineae a Terra in Solem ductae ve [illegible] [illegible], h. e. (ut accommodatius loquar Tuae [illegible] aequales (Sol enim ex appropinquatione [illegible] [illegible] duos esse debere circulos, alterum in quo Sol vehitur, [illegible] Terra, ejusdem utrumque restitutionis.

[illegible] jam sententiam correctam. Non ita absurdum videtur physice, [illegible] moveri Terram. Sententia de circuitu Solis peccat in regulam: quae [illegible] per pauciora, non debent fieri per plura. Possunt autem salvari [illegible] Sole. Sed nec circuitu opus est ad circuitum ceteris concilian[illegible] volutione id possit. Denique naturali motui magis est consentaneum, [illegible] et inferri ceteris circuitionis necessitatem, dum emanatione [illegible] utatur ad circumvehendos ceteros. At quomodo circuitus [illegible] circuitum, id non ita facile est definire. Nam interdum [illegible] quod non fit in volutione Solis et cum eo virtutis, quam [illegible] similitudinis causa dico magneticam, debui coele[illegible] virtus in omnibus planetis semper prolectat eodem, [illegible]

[illegible] quod petisti, examen propositae et prioribus literis praeteritae [illegible]

[illegible] (10. Oct. 1607): Ehrenvester, Hoch- und Wohlgelehrter, [illegible] guter Freund.

[illegible]

[illegible] Germ. [illegible] Graetium Dravo se [illegible] [illegible] milliaribus sepultam Attilae [illegible] [illegible] diligentia meridiana descripta et s [illegible] longa, divisaque circulo in 360°, certissime [illegible] [illegible], ne stilo adhaereret [illegible] [illegible] describit Keplerus rationem suam procedendi plane [illegible] 159[illegible] (Comp. II, p. 819), quae ipsi exhibuerit [illegible] [illegible] 6° idque non semel." Pragae, pergit, [illegible] taliter Graetio, instrumento utor ex orichalco, [illegible] collocato ut meridiem spectet exquisite, rectaque [illegible] seu pyxide magnetica, quae versatilis est super [illegible] sectiones incipientes a diametro, quae sit lineae [illegible] parallelus, tam diu verso pyxidem super [illegible] quae exit in indiculum, coincidat. Hoc [illegible] [illegible]. Quoties adhuc sic praestiti, semper [illegible] [illegible] ad ortum. Plurimum sane tempori[illegible] [illegible] observatis declinationibus ostenderem [illegible] semel sub fixum eclipticae polum venit. [illegible] creationis notabili invento. Nam [illegible] polorum transpositione, quae exciderunt [illegible] dete, me nulla opinione fuisse seductum, inter[illegible] quam ad minus aliquid, invitarunt me vota [illegible]

Interim commendo Tibi negotium [illegible] [illegible] (Pragae d. IV. Non. Febr. [illegible]

[illegible] insula [illegible]
[illegible] II. p. 284. [illegible]
[illegible]

[illegible] Quid igitur impedit? Nihil tu potes [illegible]. Ego quid [illegible], sed simul et respondebo. Quodcunque [illegible] [illegible] est quiescens, quocunque loco reponitur. Nam quies [illegible] [illegible] est, non indigens creatione, sed creatis [illegible] [illegible] est positivum quippiam ut lux. Itaque si lapis [illegible] [illegible] ut materiatum quippiam, sed ut vel extrinsecus [illegible] [illegible] facultate quadam praeditus ad aliquid respiciendo. [illegible] [illegible] appetentem centri mundi. Nego, sic enim vere impedietur [illegible] [illegible]. Probant, scio, futiles ipsorum probationes ab ignis natura contraria, [illegible] principii. Nam ignis non petit coelum, sed fugit Terram. [illegible] [illegible] mundi, sed Terrae materiam fugit, ut cujus crassitie obruitur. [illegible] definio gravitatem, seu illam vim, quae intrinsece movet lapidem, [illegible] coagmentantem similia, quae eadem numero est in magno et parvo [illegible] per moles corporum accipitque dimensiones easdem cum corpore. [illegible] aliquis esset pone Terram positus in notabili aliqua proportione [illegible] molem Telluris, et casus daretur, utrumque liberum esse ab [illegible] [illegible] ego dico futurum, ut non tantum lapis ad Terram eat, sed [illegible] [illegible], dividantque spatium interjectum in eversa proportione ponderum, [illegible] B massa molis, sic BC ad CA, et C locus ubi [illegible] ea proportione, qua statera utitur. Sed con- [illegible] si a lapide removeas animo facultatem illam [illegible] remansuram in lapide meram impotentiam ad [illegible]. Ut igitur illa expugnetur, vi et contentione [illegible].



Fig. 157.

Dum ergo fingimus lapidem in aëre pendentem, negamus si vim [illegible], hoc est gravitatem, et tamen eam vim Terrae in lapidem [illegible] [illegible], quamvis re vera absurdum sit, tantummodo ut nobis [illegible] [illegible] iste lapis [illegible] vim quiescendi in suo loco, [illegible] [illegible]. Ex pugna materialium et corporearum [illegible] [illegible] vincatur et vincat vim suam corpori [illegible]. Itaque [illegible] [illegible] [illegible] sequi possit circularitatem Telluris. Atque hoc [illegible] [illegible]. Quare [illegible] [illegible] Terrae in lapidem [illegible]

[illegible]

[illegible] erectus, hoc est quo minus Terra illum [illegible] in circulum rapiat. Tu jam, macte audacia, lapidem [illegible] Tellure in libra appende, ut proportionem expleas [illegible] metra. Quinque pedes aequant passum et 5000 mille [illegible] 1720000 semidiametrum Terrae aequant. Jam [illegible] metrorum. Invenies in summa 22 figuras. Ergo [illegible] sunt, ut particulae et numerus expleant 22 figuras, [illegible] tres detergantur utrinque, ergo unus passus in tot [illegible] 19 cyphris possunt efferri. Age jam et hujusmodi [illegible] tibi non per unum passus intervallum, sed si lubet, per [illegible] aëre haereat, et vide quantam sis effecturus [illegible] tur interstitia egressus et illapsus lapidis perpendicularis [illegible] tum veniam, admirabilem tibi faciam hanc disputationem [illegible] Lunae corpus terrestre, dico, si adimas utrique [illegible] corpora. Ac cum sit Luna $1/_{54}$ de Terra circiter [illegible] tota distantiae siderum, 1 dabit $1^{1}/_{54}$. Itaque [illegible] Terrae versus Lunam est locus coitus siderum, [illegible] retinetur (h. e. gravitate) ne coeant, ut [illegible] quod citra eam a Terrae magnete in pavimentum [illegible] sit apparet; quia, quae partes Terrae non [illegible] sequuntur, ut maria ad Lunam ex omnibus [illegible] Lunae contendunt, cum sint bene libratae, [illegible] acus cuspide, nec a vi Telluris multum [illegible] ser vix circumagi; ne Tellurem potiori [illegible] celeritate Lunae praeveniantur, [illegible] [illegible] quo minus celeriter sub Luna [illegible] ideo Luna abeunte a fastigio [illegible] nobis [illegible] Britannia [illegible]

[illegible]

[illegible] aliquid nihil hic nec turbat [illegible] in [illegible] (Quae sequuntur Keplerus ipse in margine [illegible] videor hallucinari, ut in primis [illegible] virtus Telluris tractoria seu [illegible] et e longinquo. Causa haec, quia omnis [illegible] vires suas intra unius diei spatium experitur. [illegible] ista hoc loco spargitur per spatia, sic ut tantundem [illegible] quantum in angusto collectim. Dico ergo: [illegible] vel [illegible] 5265 milliaria circa Terram. Itaque totum ambitum [illegible]) milliarium conficeret diebus 61⅓ et totidem fere horis. (Num [illegible] et una fere hora sentit omnem orbem virtutis ex Terra, quia interim [illegible]). Nempe diebus 63 et non ut in textu annis 10, manentibus [illegible] in textu.

[illegible] sed magnitudo Lunae &c." adscripsit Keplerus: Eadem hic quoque [illegible] Lunae densitatis proportio ad totum orbem virtuosum est ejus [illegible] ad ipsam corporis Terrae densitatem est ut 2 ad 59. [illegible] sed ea, quae 2 ad 57 (de 59 detracta una tricesima) ut [illegible], hoc est quae 1 ad 28½; et quia magnitudinum ratio est [illegible] circiter, ergo subtracta hac proportione relinquitur proportio 1 ad [illegible] 57. Atque sic Lunaris materia paulo esset densior materia [illegible] proportione ea, quae 89 ad 57, paulo majore quam 4 : 3, ut si Terra [illegible] Luna aurea. Posita vero aequalitate densitatis, tunc existeret proportio 1 ad 20⅔ et diametrorum ratio paulo major quam 1 ad 3, [illegible] 1000 ad 3056. Et quia Luna in apogaeo habet semidiametrum 15', [illegible] 228 diametris Lunae, quae divisae in 3056 et multiplicatae [illegible] 74 fere, alt. Lunae a Terra in semidiametris Terrae. Ecce propius [illegible] diversam densitatem statuere, quam astronomiae [illegible] paral-[illegible]

[illegible] sentis Fabrici? Sentio [illegible]. At [illegible] textus sed margo hallucinatur. [illegible] virtutis terrestris Lunam permeat [illegible] in majori [illegible] Martis Commentariorum [illegible]

[illegible]

[illegible] ... quaestionem aliquot annis post [illegible] ... Copernicum [illegible] parce legi, quod [illegible] ... (ed. anni 1566) mendosum esset. At [illegible] motum Terrae me prohibet quo minus ex toto [illegible] hypothesis Copernici [illegible] et commodissimus [illegible] Quomodo tu argumentum Tychonis contra motum diurnum [illegible] ... totam Copernici hypothesin expiodit. Inquire igitur [illegible] ... contradictionis expertes sint, [illegible]

Aliud argumentum contra Copernicum: si Terra [illegible] in eodem parallelo habitantes saepius unum habere [illegible] cum haec loca diurna revolutione sub iisdem nubibus et [illegible] ... Ergo &c.

Keplerus haec (d. 10. Nov. 1608) respondit: [illegible] argumenti Tychonici contra motum Terrae. Non est [illegible] ictus. Plane coincidit cum illa objectione, cur globus [illegible] culum recidat in locum eundem, si Terra interim [illegible] tantum Terram interim abire, sed una cum Terra [illegible] infinitas et invisibiles, quibus lapis alligatus est [illegible] circumstantes undique, quibusque retrahitur proxime [illegible] Terram. Quemadmodum igitur hic vis [illegible] sursum, quo fit ut omnes illae aequaliter [illegible] catenis occidentalibus, tam globus vi tormenti [illegible] orientalibus, cum vapor globum protrudit in [illegible] illis promovet motus universalis Telluris et [illegible] violentia, quae globum projicit, versatur [illegible] tam sunt fortes, ut parum contra illas [illegible] nine, [illegible] aura quieta et cum Tellure [illegible]

Si vero nullae tales essent catenae, [illegible] abeunte Terra, nec recideret ulla ratione. [illegible] quod nullus jactus, neque quoad lineae [illegible] [illegible]

[illegible] virtute magnetica Telluris. [illegible] ratione suae propriae sedis, nempe Telluris, [illegible] in objectu materiae rarioris. Exemplo [illegible] motus [illegible] projiciens lapillum propellit illum quam [illegible], ut pumicem ejusdem molis eodem [illegible] Sed ad vapores redeo. Illi igitur asportantur [illegible] a virtute magnetica Telluris, et sic quiescunt [illegible], quantisper non a causis aliquibus impelluntur, quae [illegible] origine nascuntur. Impulsi vero ab iis causis, quae [illegible] a catenis illis magneticis avelluntur in plagam quamcunque, [illegible] si causa aequalis. Quippe in eorum motu non consider[illegible] per aetherem, sed multitudo catenarum seu longitudo [illegible] ad trajiciendum per aetherem non indigent sua opera, [illegible] navi. Adeoque geminum est exemplum navis et vectorum in [illegible], nisi quod vectores navis non attrahit magnetica virtute, sed solo [illegible], eosdem vero Tellus adhuc attrahit per gravitatis virtutem, quam [illegible] communicat [illegible] navis, vapores vero et projectilia non attrahit aether; [illegible] sua navi (id est a Tellure) attrahuntur. Non itaque ut in navi ex [illegible] corporum jactationes, dum abripiuntur corpora a locis iis [illegible] tendunt, gravitatis momentis, non, inquam, sic etiam jactari [illegible] nostri, dum a Terra abripiuntur, neque n. tendunt ea ad ullam [illegible] sed ad solius Terrae subjectum planum per catenas magneticas [illegible] in demonstratione geometrica, ut ad centrum tendant gravia; [illegible] ad centrum tanquam ad rem geometricam, sed tanquam ad [illegible]. Nisi n. Terra rotunda esset, ad idem ejus commune punctum [illegible] non tenderent.

[illegible] objicies, vapores non trahi a Terra, cum potius fugiant a Terra. [illegible] vapore, cum exit ex Terrae visceribus, inesse duas res, materiam et [illegible] materiam. Cum igitur partes alienae vaporis a calore extenuatae [illegible] superius aura gelida crassior [illegible] in aëre [illegible] a Terra [illegible] urgetur et expellitur a graviori [illegible] altitudinem [illegible] Argumentum [illegible] trahi a Terra [illegible] in altum tendere non ratione [illegible] sub dio, claro die, ut sit e regione [illegible] fenestris aliisque tabulis, quae dis[illegible] Videbis fluxum quendam clare (si [illegible] parietis partes tibi [illegible]

Ben Joseph Toledanus ex Arabico in linguam Hispanicam [illegible] Orat. a J. Milichio recitatam. Witeb. [illegible]

Redit ad eundem Keplerus in Epit. Astr. Cop. IV. [illegible]

25) p. 182. Copernici verba haec sunt: [illegible] eccentri, et planeta in perigaeo epicycli ex [illegible] partes, cum utrumque suum peregerit hemicyclium, [illegible] utrumque apsidum suarum medium habebit. Ceterum [illegible] quae omnia ex ipsorum motuum consequentia facile intelliguntur [illegible] quod sidus hoc motu composito non describit circulum perfectum [illegible]. Hic et paulo superius Keplerus affirmans, Copernicum solidas [illegible] p. 282), Tychonem secutus esse videtur, qui (Prog. I. p. [illegible]) [illegible] motus annui Terrae assumtionem enim (solidam [illegible]) sphaeram reposuerimus, sitque haec solida atque realis, [illegible] receptam opinionem sensisse videtur &c. — Ceterum Copernicus [illegible] sphaerarum aut expresse ponit aut expresse negat [illegible]

26) p. 483. Ut probemus Kepleri calculum, sic [illegible]

$$\text{In } \triangle ECB: \sin. CEB = \frac{\sin. ECB . CB}{EB}.$$ Dantur, CB = [illegible]

quare sin. CEB = sin. 45° × 0,0756. 0,8785[illegible]

0,8484850 [illegible]

8,7265[illegible]

∠ EBC = ECB [illegible]

Jam in △ EAB dantur EB, BA (0,126) et ∠ EBA [illegible]

EB − AB = 0,874 lg. (EB − AB) [illegible]

EB + AB = 1,126 lg. [illegible]

½ (A + E) = 20° [illegible] 4" lg. (EB + AB) [illegible]

½ (A − E) = 16. 33. 55"

∠ BEA = 4° [illegible]

[illegible]

∠ CEA = [illegible]

[illegible]

ut supra datis. Sin autem assumserimus $\delta\gamma = 0{,}30242$ et inde computaverimus angulum [illegible], prodibit quantitas hujus anguli a Keplero prodita $5^\circ\ 27'\ 47''$, [illegible] 0,27971,

[illegible] Assumta jam $\alpha\gamma = 0{,}18034$, proportionaliter prodit linea

$$[illegible] = \frac{0{,}18034\ .\ 0{,}30138}{0{,}27971} = 0{,}19432\ (\text{K. } 0{,}19768)$$

$$[illegible] = \frac{0{,}18034\ .\ 0{,}0126}{0{,}02016} = 0{,}11271$$

$$\beta\gamma = 0{,}18034 - 0{,}11271 = 0{,}06763$$

$$[illegible] = \frac{0{,}19432\ .\ 0{,}0126}{0{,}02016} = 0{,}12145\ (\text{K. } 0{,}12352)$$

$$\delta\gamma = 0{,}19432 - 0{,}12145 = 0{,}07287\ (\text{K. } 0{,}07411).$$

[illegible] hi discrepantes a Keplerianis ut prius, prodeunt adhibito numero 0,30138; [illegible] ad Kepleri numeros, usurpantes pro 0,30138 numerum 0,30242, etsi [illegible] attingunt, quantitatesque a Keplero hic proditae pro 0,30128 alium [illegible] indicant.

[illegible] Denique [illegible] # $\delta\alpha$, erit $\vartheta\beta = \frac{\delta\alpha\ .\ \beta\gamma}{\alpha\gamma}$; $\beta\gamma$ „in dimensione $\delta\alpha$" est 0,10489, [illegible] 0,06344.

[illegible] p. 189. Assumtis iisdem numeris, qui supra Keplero prodierunt, in $\triangle\ \vartheta\gamma v$ ad γ [illegible] prodit $\gamma v = \sqrt{1 - 0{,}07411^2} = 0{,}99725$.

In $\triangle\ \beta\gamma\chi$ ad χ rectangulo, dantur $\beta\gamma = 0{,}06763$ et angulus $\gamma\beta\chi = \vartheta\gamma\beta = 5^\circ\ 27'\ 47''$,

$$\text{quare } \gamma\chi = \sin.\ \beta\ .\ \gamma\beta = 0{,}006438$$

$$\text{et } \beta\chi = \cos.\ \beta\ .\ \gamma\beta = 0{,}06732.$$

Denique in $\triangle\ \beta\chi\varphi$ datis duobus lateribus ($\beta\varphi = 1$) prodit tertium

$$\chi\varphi = \sqrt{1 - \beta\chi^2} = 0{,}99773$$

$$\gamma\chi = 0{,}00644$$

$$\gamma\varphi = 1{,}00417$$

$$\gamma v = 0{,}99725$$

$$v\varphi = 0{,}00692.$$

[illegible] in „Tychonis Brahei Vita", ut ipsissima Tychonis verba [illegible] te, mi Joannes, ut quando, quod tu Soli pellicienti, ego ipsis planetis [illegible] et quasi adiuvantibus tribuo, velis eadem omnia in mea demonstrare [illegible] in Copernicana declarare, tibi est cordi." (Cass. Opera V, p. 404.)

[illegible]

[illegible]

[illegible] p. 310 [illegible]

[illegible]

In $\triangle\, \beta\iota\delta$ ad ι rectangulo prodit $\beta\iota = \delta\beta$. sin. [illegible]
$\delta\iota = \delta\beta$. cos. [illegible]
$\iota\varrho = \delta\varrho - \beta\iota$ [illegible]

Jam $\triangle\, \beta\varkappa\delta$ fig. 59. respondet $\triangle\, \gamma\delta\varkappa$ fig. 56, [illegible] $\beta\upsilon = 1$; et cum pag. 189. demonstratum sit, ad [illegible] eandemque $\lambda\mu = 0{,}01344$ ad radium $\lambda\varrho = 1$, quare [illegible]

hinc $\beta\upsilon = \frac{40}{61} = 0{,}65573$ (K. 0,656[illegible]), ad radium [illegible]

83) p. 199. Ad deprehendendam quantitatem lineae [illegible] ipsique minus usitatam; calculo utitur algebraico, [illegible] quam ratio geometrica.

Keplerum secuti rem explicavimus [illegible] esse $\iota\beta = \delta o$, $\iota o = \beta\alpha$; deinde quod [illegible] in σ [illegible] $\iota\varrho$ per superiora $= 0{,}91145$, $\iota\varrho = 0{,}0095$[illegible] ergo ιo = [illegible]

$\iota o = \beta\alpha = 0{,}906685$; signetur $\beta\alpha$ litera d. Deinde [illegible]

[illegible]

Signetur linea $\nu\psi = \varepsilon\psi$ per literam x, erit $\beta\psi$ = a + x [illegible] rectangulum:

$$\alpha\psi = \sqrt{(a+x)^2 - d^2} = \sqrt{a^2 - d^2 + \ldots}$$ [illegible]

Sic, quia $\triangle\, \varepsilon o\psi$ ad o rectangulum [illegible]

$$\varepsilon\psi^2 = b^2 + (c + \ldots$$ [illegible]

$$x^2 = b^2 + (c + \sqrt{a^2 - d^2 + 2ax + x^2})^2$$ [illegible]

$$= b^2 + c^2 + a^2 - d^2 + 2ax \ldots$$ [illegible]

$$4c^2(a^2 - d^2 + 2ax + x^2) = (d^2 \ldots$$ [illegible]

$$= d^4 \ldots$$ [illegible]

$$x^2(4c^2 - 4a^2) + x(4ac^2 + 4ad^2 \ldots$$ [illegible]

$$= a^4 + 2a^2b^2 \ldots$$ [illegible]

[illegible]

Anno [illegible]. in 6° 46′ 40″ ♊
17. 30. ♉
19. 16. 10. Inclin. 37′ 20″. 17. Nov. [illegible] 9. 40.
Complem. 70. 43. 50. compl. 89° 22′ 40.
[illegible] 42′ [illegible] × [illegible] 89° 22′ 40″
[illegible] × [illegible] = 94291 — 70. 43. 4.
differentia 46.
[illegible] Locus in circulo 6° 46′ 56″ ♊

Anno 82. in 16° 46′ 10″ ♋ incl. 1° 38′ 30″.
17. 30. ♉ compl. 88. 21. 30.
dist. 59. 16. 10.
compl. 30. 43. 50.
30. 43. 0. 99959 × 51100 = 51079.
differentia 50″
16. 46. 10.
Locus 16° 47′ ♋

Anno 85. in [illegible] 40′ 26″ ♌ incl. 1° 54′ 22″
17. 30. ♍ compl. 88. 5. 38.
86. 19. 34.
3. 40. 26.
3. 40. 19. (diff. 7″) 99945 × 6408 = 6404[illegible]
Locus 21° 10′ 19″ ♌

Anno 87. in 25° 10′ 20″ ♍ incl. 1° 30′ 43″
17. 30. ♍ compl. 88. 29. 17.
52. 19. 40.
37. 40. 20.
[illegible] 17. 99966 × 61111 = 61090
differentia 3.
Locus [illegible] 17. ♍

Anno [illegible] in [illegible] 10″ ♏ incl. [illegible]
[illegible] ♏ compl. [illegible] 44.
[illegible] 10.
[illegible] 50.
[illegible] 44. 99997 × [illegible] = 97220
differentia [illegible] 6″
Locus [illegible] 4″ ♏

[illegible] Locus [illegible]
[illegible] Hic [illegible]
[illegible] est [illegible]
[illegible]

Anno 1582.	Incl. 1. 38. 30.	101768 . 7450		
	Lat. 4. 6. 0.	4294		
	2. 27. 30.			
Anno 85.	Incl. 1. 54. 22.	101280 . 7909		
	Lat. 4. 32. 10.	4589		
	2. 37. 48.			
Anno 87.	Incl. 1. 30. 43.	100350 . 6343		
	Lat. 3. 38. 12.	3708		
	2. 7. 29.			
Anno 89.	Incl. 0. 26. 49.	99200 . 1942		
	Lat. 1. 6. 45.	1161		
	0. 39. 56.			
Anno 91.	Incl. 1. 29. 5.	98282 . 6947	156518	
	Lat. 3. 59. 0.	486		
	2. 29. 55.			
Anno 93.	Incl. 1. 43. 40.	99340 . 10540		
	Lat. 6. 3. 0.	2536		
	4. 19. 20.			
Anno 95.	Inclin. periculose quaeritur, quia prope [illegible]			
Anno 97.	Incl. 1. [illegible] 0.	[illegible] . [illegible]		
	Lat. 3. 33.	3839		
	2. [illegible]			
Ao. 1600.	Incl. 1. 53. 10.	[illegible] . [illegible]		
	Lat. 4. 30. 50.	4584		
	2. 37. 40.			

21⅓ ♌ 174553.
8⅔ ♌ 174277.
[illegible] 171[illegible]
[illegible]
28⅓ ♐ 156518.
18⅓ [illegible]

2⅔ ♂. Hic [illegible]

Pars summa ... 35″ secundum numerationem tabulae Tychonis.

1. 16. 46. 35.

2. 6. 46. 16.

19. 59. 35. latus unum.

20. 3. 45. latus alterum seu basis.

... 37387, perpendic. posterius 36383 (36520).

37387 . 36520 = 100376 = sec. 4° 57′ 40″

Ex tab. Tychonis.

Apog. 4. 23. 19. 45.

1. 25. 28. 44 long. simpl.

9. 2. 8. 59.

11. 20. 36.

2. 6. 40. 37. Computatus.

Profitetur 2. 6. 20. 40.

	♂ med.	Apog. ♂	Praecessio.	Nodus.
9. 16. 30. 30	8. 9. 35. 48	4. 23. 21. 1	27. 53. 50	1. 16. 48.
	2. 11. 33. 20	4. 6	1. 42	8. 16. 51. 27
	Ponitur 34. 53	4. 23. 22. 7	50	0. 26
		3. 9. 39. 40	0. 22	2. 0. 3. dist. a nodo.
		10. 16. 15. 41	28. 0. 38	60. 3. 0 basis.
		8. 28	ponitur	59. 57. 48 latus.
		7. 17. 11		

Tg. basis, tg. compl. lateris.

173555 . 57823 = 100855

8. 16. 52. 59 comput. sec. 4° ... 20″

8. 16. 51. 28 ponitur. ang. ...

		4. 23. 22. 22	27. 38. 50	1. 16. 50. 18
	28.	4. 20. 40. 18	4. 15	4. 21. 16. 20
	3. 22. ...	11. 27. 15. 49	4	3. 4. 20. 8
		10. 44	28. 3. 9	35. 39. 52
		Profit. 28. 24	28. 2. 25	35. 40. 28

... 1580. 12. Nov. h. 10. 50. in 8. 36. 15. II ...

8. 1. 32. 12.	4. 23. 28. 5...	...	1. 32. 52. 12
		37	25. 10. 20
		9	41. 41. 52
		4. 58	41. 47. 2

... alterum 1. 52.

[illegible]

	⊙ med.	♂ med.	Apog. ♂
1592. Jul.	5. 12. 54. 35	11. 9. 3. 39	4. 25. [illegible]
	5. 12. 43. 45	28. 10. 21	11. 9. [illegible]
	5. 12. 35. 0	10. 10. 53. 18	6. 15. [illegible]
		10. 10. 53. 56	[illegible]
			11. 12. 38. [illegible]
			11. 12. 34. [illegible]
1594. Sept.	7. 17. 56. 17	1. 6. 38. 22	4. 23. [illegible]
	7. 17. 56. 15	28. 10. 17	1. 6. [illegible]
	7. 17. 56. 5	8. 26. 5	[illegible]
		8. 26. 47	[illegible]
			[illegible]
			1. 17. [illegible]
			1. 17. 57. [illegible]

Hic addita sunt ad orbitam tantum [illegible] idque [illegible] modo additur. Nam nodus 1. 17. Ergo distantia fere 1°. [illegible]

1596. Nov.	9. 2. 28. 51	2. 28. 3. 54	4. 28. [illegible]
	9. 2. 28. 0	28. 14. [illegible]	[illegible]
	9. 2. 34. [illegible]	[illegible]	[illegible]
			3. 22. 54
			3. 2. 31. [illegible]
			3. 2. 32. 20
1598. [illegible]	[illegible] 8. 18. 43	[illegible]	[illegible]
	[illegible] 8. 18. 0	28. 10. 55	4. 5. 1. [illegible]
	10. 8. 18. 45	[illegible]	[illegible]

[illegible]

1600. 12. Nov. [illegible]

[illegible]

ita, ad assumtum tempus ♂ fuerit in 16° 47′, correctius in 16° 49′ ♋. Et [illegible] in 16. 46. 16. ♋.

Anno [illegible] 31. Jan. h. 12. Mars in 21° 18′ 11″ ♌. Sed per refractionem [illegible] in 21° 20′ 11″ ♌. Ergo horis 7. 35′, cum diurno 24′ 15″ venit [illegible]. [illegible] ergo ♂ 21° 12′ 30″ vel 21° 10′ 30″ ♌. Et posuerunt 21° 10′ 26″. [illegible] illos jam bis usurpatam opinionem postea rursum [illegible].

[illegible] ad 7. Mart. h. 19. 10′ deductus locus ♂ 25° 10′ 20″ ♍.

Tempus assumtum 17. 22.

differ. 1. 48. Et totidem minuta sunt motus horarius. [illegible] 25° 8′ 32″ ♍. At ponitur 25° 10′ 20″.

A. [illegible] 15. Apr. h. 12. 5. 3° 58′ 21″ ♏ valde diligenter.

Parallaxis vero long. 1. 10. subt.

3. 57. 11. Differentia horarum 1′ 30″. Minus [illegible] nam diurnus est 22′. Ergo 3° 58′ 30″. Et assumsit 3° 58′ 10″.

[illegible] dies 4 habent 1° 12′ 47″ motum die 6. h. 12. 20′ in 27° 15′ ♐.

8. 16. 25.

2. 4. 5. Ergo differentia [illegible] h. 4. 5′ habebit motum pro 2 diebus 36. 24.

pro 4 h. 3. 4.

5 m. 4.

39. 32.

[illegible] 26° 35′ 28″ ♐. Ponunt 26° 32′ 0″.

A. [illegible] 24. Aug. h. 10. 30. Mars in 12° 38′ 0″ ♓. diurn. 16′ 41″

2. 13.

8. 17. Horarius 0. 5. 48.

12. 43. 48. Ponunt 12° 43′ 45″.

[illegible] Oct. h. 8. Mars in 17° 48′ ♉. Diurnus 32′ 54″.

[illegible] 24. 22.

[illegible] 11. 7.

Ergo 17. 59. 7. Ponunt 17° 58′ 45″.

[illegible] Dec. h. 8. 30. ♂ in 3° 30′ ♋. Diurnus [illegible]

[illegible] 13. 35.

5. 5. Scrupula totidem [illegible]

[illegible] 1. 10. 0.

[illegible] 5. 5.

[illegible] 1. 15. 5. [illegible] 2° 17′ 0″

[illegible]

A. 1590. 4. Mart. h. 7. 10′ circ. fuit declinatio [illegible]
recta 22° 35′ 10″. Cooritur 24° 24′ 12″ ♈, angul [illegible]

respondet 24° 22′ 56″ ♈, lat. 3. 12. Hinc [illegible]
24° 22⅓′ ♈, lat. 0° 3′ 20″. Dubitatur, sitne [illegible]
ergo locus assignatus eclipticae remotus ab aequatore [illegible]
post subtractionem Martis latitudo meridiana. [illegible]
refractionem, lat. 0′ 4″ ⅓ merid. Cum ergo a. 90 [illegible]
integram revolutionem jam septentrionalis, nodi [illegible]
non esse duas integras revolutiones a 4. Martii in 10. Dec. [illegible]
10. Dec. a. 93. His tribus diebus haec latitudo potuit [illegible]
esset sept. Quid si die 7. plus esset sept. et 10. Dec. [illegible]

A. 95. 27. Octob. h. 12. 20′ latitudo Martis [illegible]
fuit 0° 2′ 20″ m. Die 28. Oct. itidem post [illegible]
0° 0′ 25″ s. Hic vides intra eundem diem incidere [illegible]
ticam. Confer hos dies cum Ptolemaei observatione, [illegible]
respectu eccentrici, et habebis motum nodorum [illegible]

Die 23. Jan. 92. vesperi h. 10⅓. fuit ♂ in 11 [illegible]
Altitudo Martis circiter 25°. Refractio nulla. [illegible]
gius igitur adhuc a Terra abfuit Mars quam Sol, [illegible]
paulo. Est Solis in altit. 25° 2′ 38″. [illegible]
recto, 120° circiter. Itaque iterum [illegible]
aut minus. Ergo et hic ☊ in ecliptica.

Pro nodo altero h. 7⅓ matut. — A. 1595 [illegible]
8° observaretur a Spica [illegible]
Ibi longitudinis motus fere manet invariabilis, [illegible]
portio pro latitudine, vel potius pro [illegible]
est corrigenda per parallaxin quidem [illegible]
autem refractio, non igitur tam alta [illegible]
minus igitur sept. [illegible] in [illegible]

1. 45. 38. [illegible]	[illegible]
1. 43. 3.	Stylo vet. [illegible]
0. 35.	1595. 20. [illegible]
11. 27.	[illegible]
18. 2.	28. 24. Dec. [illegible]
[illegible]	[illegible]

[illegible] probatur. Cum angulus verticalis et eclipticae sit circiter [illegible] minor verticali erit latitudinis et refractionis [illegible]; forte [illegible]. Est autem Mars in vicinia Solis, minor itaque ejus [illegible]. [illegible] in alt. 8° parallaxin 2. 52. Huic adime circiter sextam [illegible] 2′ 24″. Et haec est verticalis parallaxis. [illegible] adime [illegible] circiter, restabit 2′ circiter parallaxis latitudinis. [illegible] 5′ 45″. Jam adime et refractioni partem quintam, restat [illegible] 24″, [illegible] subtrahe, restat 21″ bor. Ergo hoc die fuit in nodo.

[illegible] qualis sit ejus dispositio in eccentrico, ut appareat, ubi sit diameter [illegible]

[illegible]		prior simpl. 3ˢ 6° 24′ 52″ anom.
[illegible] 23′ 39″	4ˢ 23° 35′ 8″	posterior 8. 12. 2. 56.
1. 34. 20.	8.	5. 5. 38. 4.
[illegible] 9. 0. 0.	3. 6. 24. 52.	prior coaeq. 2ˢ 24° 55′ 50″
11. 29. 2.	11. 29. 2.	8. 23. 20. 2.
[illegible] 12. 31.	2. 24. 55. 50.	6. 1. 35. 48.
[illegible] 4. 17.	50.	5. 28. 24. 12.
[illegible] 2. 0.		
[illegible] 5. 29. 56.	4. 23. 36. 0.	
11. 17. 6.	1. 5. 38. 56.	
[illegible] 16. 56. 2.	8. 12. 2. 56.	
	11. 17. 6.	
	8. 23. 20. 2.	

Differentia 1° 38′, quam conficit Mars diebus tribus. At per tantum temporis errari per institutiones refractionum et parallaxium non potuit.

Investigatio limitis borei.

A. 1595.

8ˢ 9° 47′ 54″	Nodi 2ˢ 24° 55′ 50″
2. 24. 55. 50.	[illegible]
11. 26. [illegible] 56.	[illegible]
[illegible]	[illegible]
[illegible]	1. [illegible] 56.

[illegible]

[illegible] Theodosii [illegible] Vogt [illegible] Clavii [illegible] Waldierus (Hist. Astr. p. 148) [illegible]

[illegible]

38) p. 219. In Tychonis Progymn. I, p. 414 haec [illegible] in tribus superioribus planetis vix locum invenias [illegible] mento et has parallaxes experiri licebit, praesertim in [illegible] ego parallaxes circa id temporis demensus sum; quarum [illegible] manifestabo.

Item p. 661: nec in Marte acronychio alia quidem [illegible] planetarum) experiri et prout speramus satis certe [illegible] alibi convenientius aperiemus.

Eadem quae hic, recoquit Keplerus in „Tychonis [illegible] literis ad Dav. Fabricium datis.

Fabricius in postscriptis ad epistolam d. [illegible] quaerit: In Mysterio Cosmographico ostendis ex proportione [illegible] portiones sphaerarum ad se invicem. Cupio scire, an [illegible] quorum motus perfecte nunc constant, veritati et [illegible] si de vera eccentricitatis proportione de illis constat. [illegible] recte dictum, omnia in numero et mensura [illegible].

Keplerus respondit: An adhuc stet Mysterium [illegible] bisectio eccentricitatis Solis benignissima [illegible] et hoc procul dubio est, quod me torsit fol. 61, [illegible] p. 465 et 158 s.), quod sc. in compensationem [illegible] quae mihi ex antiqua persuasione accesserat, [illegible] addita plus justo habui, eliminata, minus [illegible].

Exerceamur: radii orbis Martis 10[illegible], quid 90700? — 138304, ima ♂. Summa [illegible] dat 79465, radium inscripti icosaëdro, quid [illegible] in dodecaëdro; summa Terrae . . . . .

Si ergo Terra a Sole distaret talium partium 10[illegible] tunc exquisitissime [illegible] Mysterium. [illegible] metri Terrae, [illegible] — 754. Quia [illegible] distare 60 ubi plurimum Terra igitur [illegible] At ponitur distare [illegible] sed periculosa et [illegible] [illegible]

[illegible] Solem sustulero, hoc longius a meo Mysterio discessero. — (Ex epistola [illegible] 1605. Comp. p. 99.)

[illegible] (d. 29/30. Jan. 1607): Statuis parallaxin Martis non tantum esse, quantam [illegible] Solis multo minorem. Respondeo: non potuit per Tychonis [illegible] Solis [illegible], et cum ♂ medium fere ⊙ orbem habet, quomodo [illegible] habeat? [illegible] (1. Aug. 1607): De parallaxi ♂ me non percepisti. [illegible] Solis [illegible] est dimensus suis instrumentis, sed assumsit [illegible] ex [illegible] esse 3′. Hac parallaxi Solis majorem pronunciavit Martis per [illegible] deceptus sit a ministris calculi, scripsi ante [illegible]. Nam si [illegible] Martis, quae Braheus ipse destinavit Martis parallaxibus inqui-[illegible] minorem parallaxin 3′, minorem etiam 2′. Ex hoc ratiocinor ut tu, [illegible] nimirum assumo veram ex Braheo vel Copernico proportionem orbium. [illegible] parallaxis in opposito Solis est minor 2′, Solis parallaxis non erit [illegible] 1′. [illegible] vero quidem ex eclipsium doctrina nihil aliud quam hoc [illegible] esse nullam Solis parallaxin, item illud: non esse majo-[illegible]. At inter 0′ et 3′ incerti relinquimur ab eclipsibus, ut olim pre-[illegible], in Hipparcho.

[illegible] Vol. XIV, haec habet ad „Inquisitionem parallaxeon ♂ ex observatio-[illegible], quas habuit anno 1583, Januario,“ quaeque referenda sunt ad p. 220.

[illegible] 7. 30′ ♂ [illegible] pedis Erichthonii 23° [illegible] alt. 51°. [illegible] et 5. 30′ eidem dist. 23° 16′ [illegible] Alt. 33° 31′. [illegible] Hinc horarius habetur 35″. [illegible] 7⅔. — 23. 29.

[illegible] 23. [illegible] 5⅓. — 23. 16

[illegible] 23. 16 [illegible] 21⅔. 13.

[illegible] 44. 20 [: 24. 15] = 36″ fere. 21. 50 [illegible]

[illegible] 11 [illegible] alt. ♂ 29° [illegible] dist. 23. [illegible] 10. 55

[illegible] 23. 20 [illegible] 23. 1[illegible] [illegible]

[illegible] 51′ dant [illegible] 7′ sine parall. 12. 54

[illegible] 55 [illegible]. Ergo parall. [illegible] in longum. [illegible] ♉ est in nonagesimo, ♂ ergo in 10° ♋ distat ad [illegible] 28° ♌ in nonag., ♂ ergo distat ad occasum 48°. [illegible] ex Copernico, alt. 28° ♌ — 55. Sit altitudinis parallaxis per [illegible] 15″ 17‴ [illegible] 28″ [illegible] 36″ 25‴. Summa 71″; deducimus [illegible] 65; ergo [illegible]

[illegible] 40′ [illegible] 29 et 30′ [illegible]

[illegible]

hendit in illius columna, quae inscripta est 60 [illegible]

55' 38"; differentia inter hoc et aream ad marginem [illegible]

= 22,6; 55' 38" + 22,6" = 56' 0,6". Haec [illegible]

3° [illegible] fuerat), dat 2° 48' 1,8". Jam [illegible]

quae inscribitur 80, ad marginem 68 (additis scrupulis [illegible]

addita ad 2° 48' 1,8" exhibent lat. ♂ = 2° 48' 20,6" [illegible]

40) p. 229. 1) Posita distantia Martis C a Sole [illegible]

B = 3, erit AB : CB = 3 : 5 = 1 : 1,6666.

Deinde [illegible] AD (= ½ AB) = 1, [illegible]

ergo cos. CAD = [illegible]

∠ CBD = ∠ CAD = [illegible]

[illegible] ∠ CBE = 79½°, ∠ BCA = [illegible]

CB vergat in 17° ♌, [illegible] CA vergat [illegible]

4° 17° — 85° = [illegible]

2) Assumta proportione AB : CB = 8 : [illegible]

CB = 2,75, ergo cos. CBD = $\frac{1}{2,75}$, ∠ CBD [illegible]

= 42° 40'. Locus Solis B a C visus in 17° [illegible]

+ 42° 40' = 11, 29° 40' [illegible]

in 4½° ♉, neque vero in 24½° [illegible]

Locus Solis erit primo [illegible]

secundo [illegible]

[illegible] fere.

sive [illegible] loco Martis [illegible]

41) p. 233. Keplerus ponit ∠ CBE [illegible]

= 6° 8'. Adhibita [illegible]

[illegible]

[illegible] subtilitatem minime assequuntur." De Globo Apiani refert Keplerus [illegible] Horologio Chyrurgus 15. p. 193. (Cosmographiam [illegible] editam fuisse [illegible] vol. II. p. 419.)

[illegible]) p. 295. „Distat ⊙ a ♂ h. e. a puncto opposito Marti, quod est in 8° 37′ ♐; Solo in 0° 45′ 36″ ♐ existente, differentia locorum est 8° 37′ — 0° 45′ 36″ = 7° 51′ 24″. [illegible] compositus Martis et Solis = 1° 24′, ergo 7° 51′ 24″ conficiuntur in [illegible] = 5 d. 14h. 44′

[illegible] facta est Nov. 12. 10. 50

[illegible] die 18. 1. 34. Novembris.

[illegible]) p. 295. Laudes, quas confert hic Keplerus in Lansbergium (comp. Vol. I. p. [illegible]) testantur gratum ipsius animum et liberum de aliis judicium. Vir toto coelo Lans[illegible] doctrina et ingenii subtilitate, non aspernatur publicas agere gratias [illegible] trigonometricarum, quibus uti consueverat in calculis suis astronomicis, [illegible], ut ipse innuere videtur Keplerus, hoc tantum differunt a tabulis aliis illorum tem[illegible] exhibeant quasi brevissimam in praxin trigonometricam et tabulas [illegible] trigonometricarum. Parum gratiae refert Lansbergius Keplero pro hac [illegible] postea in libris suis astronomicis affirmans, „Kepleri [illegible] aberrare falsa et absurde, quam Tychonicas" (Uranometriae libri III. [illegible]) et novas condens tabulas, quia Tabulae Rudolphinae [illegible]" (Tab. motuum coel. perpetuae [illegible] Middelb. 1632), quam ob rem [illegible] Horroccius Anglus, infra plurimis dicendus. [illegible] loci non plane consentiunt calculo. Nam si locus Soli [illegible] 29° 4′ 53″ ♊ [illegible] locus Martis in 3. 45. 30 ♋ [illegible] puncto oppositionis per 4° 40′ 37″, quod dicit Keplerus [illegible]

[illegible]

49) p. 239. Iterum hic △ ABC (Fig. 69) [illegible]

$$\cos. AC = \frac{\cos. 8^\circ [illegible]}{\cos. 1^\circ [illegible]}$$

$$AC = 8^\circ [illegible]$$

Observationes, quas exhibet Keplerus, Fabricius [illegible]
13/23. Martii 1602, addens: mitto observationes acronychas [illegible]
in ♃ et ♄ post mittam, ubi vestras accepero literas. Quomodo [illegible]
succedant, non intermittes quin saepe me certiorem de iis [illegible]
concludit pastor sollicitus, in Augustanae confessionis [illegible]
tuis maneto. Deus in exilio tuo vobis praevidebit, [illegible]
D. Hunnii libros interdum legito. Vale.

50) p. 243. Solutionem hanc dicit Keplerus in [illegible]
regulam falsi" eamque huic declarat. (Vide supra p. [illegible]
Hervarto et Magino scripserat, leguntur p. 25, 4[illegible]

51) p. 246. Franciscus Vieta (nat. a. 1540 [illegible]
vincia — Poitou — Ludovico XIII. a consiliis; mortuus [illegible]
in mathematicam doctrinam, cujus partem [illegible]
analysin algebraicam ad geometriam applicavit [illegible]
ductis literarum signis in aequationibus. In [illegible]
exsuscitatus Apollonii Pergaei περὶ ἐπαφῶν [illegible]
„Appendicula II." (in editione Operum Vietae [illegible]
fol. 348) haec dicit Vieta: Ptolemaeus ipse et [illegible]
tribus epochis mediis et totidem apparentibus [illegible]
non se produnt, assumentes opus tanquam [illegible]
vero Copernicus [illegible] non solum [illegible]
Jubet enim, non jam artis sed aleae magister, [illegible]
ex sua [illegible] [illegible]
logista fuit infelicior geometra Copernicus; itaque [illegible]
autem quamplurima.

Deinde „appendicula I." (fol. 339 dictae editionis [illegible]
Fr. Vietae ad problema, quod proposuit [illegible]
mata, [illegible]
braico, [illegible]
geometrica [illegible]

[illegible]

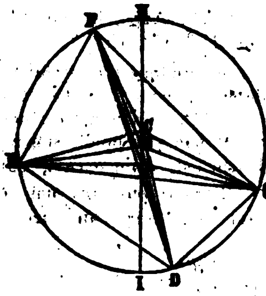
8. [illegible] h. 7. 28', locus ☉ 26° 42' 3" ♊; ♂ 26° 43' 3" ♐. Tertia ex computatione [illegible]; longitudo bene habet. Tempus est 25. Aug. h. 16. 52', locus 12° [illegible] ♓. Quarta ad 30. Oct. h. 8. 20', locus 17° 47' 15" ♉.

[illegible] de novo aggressus ponit aphelium 29° 0' 35" ♌ et longitudines: 6ˢ 9° 50' 8", [illegible] 11ˢ 9° 54' 18", 1ˢ 7° 14' 1"; et calculo absoluto, cum deprehenderet, [illegible] in circulum incidere, diminuit aphelium per 11'. Calculus ostendit, [illegible] minuenda esse, quo facto summa angulorum ad D non prodit summae [illegible] item additis 3' 44" (comp. fol. 247). „Ratio est, quia erravi, cum [illegible] promovere apogaeum, id removi re ipsa." Iterum vero res non ex [illegible] totum hunc repetitionem institutam esse perperam; addi[illegible] pridem correctae longitudini.

BAE	prius	103° 49' 59",	jam	106° 8' 36"
CAE	—	101. 43. 45.	—	101. 45. 24
		2. 6. 14		4. 23. 12
				2. 6. 14
				2. 17.

[illegible] addita absumunt 2° 17', quid addendum, ut consumantur 4° 23' 12"? [illegible] longit. Tychonis. Apogaeum jam 28° 57' 19", prius [illegible] 29° 34'." Calculus nondum ad scopum perducit, quare iterum [illegible] frustra per 14 folia quaerit optatum, ut denique adscripserit: „Major [illegible] Tum „scrupulo" (1') deprehenso rem de novo aggreditur, cum [illegible] inquit, contrarium est factum ejus, quod intenderam; [illegible] apogaeo 1' 58". Quod quum nondum sufficeret, addit 7", deinde [illegible] Hinc prodit differentia duorum angulorum ad D et duorum ad [illegible] satisfacit quod positum est, quare repetito calculo, sic incipit: [illegible] repetitio eorum, quae sunt supra; ultimum et ultima [illegible] per 7 folia producto adscribit: „manifeste apparet residua [illegible] hic scrupulus tollatur, compara priorem eccentricitatem [illegible] Prius plus justo colligebamus e. [illegible] minus justo [illegible] proportionali, prodit apogaeum 29° [illegible] 55", addendum [illegible] eccentricitas tota [illegible] eccentrici [illegible]. Haec ergo [illegible] aliquis. Tunc [illegible] 25° [illegible] methodo aliam ingreditur [illegible] inquiens: „Dis[illegible] 27." (28), et iterum [illegible] per [illegible] fuit frustranea, cum hypothesis [illegible] aber[illegible] si aphelium ponamus in 29° ♌ in margine: Minimo, [illegible] sunt [illegible]

Fig. 138.



Ergo:

$$AF = \frac{\sin. [illegible]^\circ\ 6'\ [illegible]}{\sin.\ 5^\circ\ 7'\ [illegible]} = 5,9431$$

$$AD = \frac{\sin.\ 11^\circ\ [illegible]'\ 34''}{\sin.\ 2^\circ\ 17'\ 40''} = 4,8058$$

Lineae AE quantitatem [illegible] prodit 52307, cum ipsi [illegible] exhiberet 52302, pro [illegible] typographico, quotientem [illegible] in sequenti calculo AE [illegible] genda quaedam [illegible] editione patebunt.

Ceterum omisimus, [illegible] late apposuit Keplerus, repetere in textu, satis ad [illegible] quibus usus est et calculi summam addere ipsumque [illegible] nostris illustrare, adhibentes numeros modo praemissi [illegible] differentes, quia Keplerus sinus suos nimis decurtavit.

54) p. 247. In triangulis FAG, GAD, HAE, [illegible] comprehenso, quaeruntur anguli reliqui, [illegible] 4,8058, 5,2306, aliquantulum a Keplerianis differentibus [illegible]

1) In △ FAG.

$\frac{1}{2}(G+F) = 44^\circ\ 31'\ 48''$ — [illegible]
AF — AG = 0,8727 — [illegible]
AF + AG = 11,0485 — [illegible]

$\frac{1}{2}(G-F) = 4^\circ\ 27'\ 25''$ — [illegible]
44. 31. 48

∠ G = 48. 59. 13
∠ F = 40. 4. 23.

3) In △ AHE.

[illegible]

[illegible] HCF = [illegible] — 4. 28° 40′ 20″ = 32° 8′ 36″

[illegible] = [illegible] — 4. 28. 47. 20 = 126. 52. 58

HCD = 11. 0. [illegible] 34 — = 11. 2. 14

HCE = 0. 7. 6. 51 = 68. 19. 31

[illegible] in △△ AFC, ACG, ACD et ACE latere AC = 1 et angulis, prodit

[illegible] $= \frac{\sin. 32° \; 8′ \; 36″}{\sin. \; 5° \; 7′ \; 56″}$ AG $= \frac{\sin. 53° \; 7′ \; 2″}{\sin. \; 9° \; [illegible] \; 11″}$

[illegible] = 5,0741.

[illegible] $= \frac{\sin. \; 11° \; 2′ \; 14″}{[illegible] \; 40″}$; AE $= \frac{\sin. \; 68° \; 19′ \; 31″}{\sin. \; 10° \; 14′ \; 15″}$;

[illegible] = 4,7[illegible] = 5,2287.

[illegible], datis in △△ AFG, AGD, ADE et AEF duobus lateribus cum angulo [illegible] angulorum differentiae sic computantur:

[illegible] In △ AFG — 2) In △ ADG

$\frac{1}{2}$ (G + F) = [illegible] — $\frac{1}{2}$ (D + G) = 53° 14′ 23″

[illegible] — AG = [illegible] — AG — AD = 0,2921

[illegible] + AG = [illegible] — AG + AD = 9,8561

[illegible] — $\frac{1}{2}$ (D — G) = [illegible]

[illegible] △ ADE — 4) In △ AFE

[illegible] — $\frac{1}{2}$ (E + F) = [illegible] 50′ 41″

[illegible]

58) p. 248. Datis in △ GBE angulis GBE [illegible] latere GE (9,7632), prodit $BG = BE = \frac{\text{sin. } [illegible]}{\text{sin. } [illegible]}$ [illegible]

$= 5,3883$ [illegible]

Keplero prodit BE = 5,3860 ob errorem calculi in [illegible]

In △ BGA dantur duo latera cum angulo comp[illegible]

$\frac{1}{2}(A + B) = 87^\circ\ 4'\ 29''$ [illegible]

BG — AG = 10,3144 [illegible]

BG + AG = 10,4622 [illegible]

$\frac{1}{2}(A - B) = 30^\circ\ 27'$ [illegible]

Keplero prodeunt 30° 17' 8'', [illegible] BE [illegible]

87. 4. 29

∠ BAG = 117. 21. 37 (vera quantitas = [illegible]

59) p. 249. In △△ GFA, GCA, CDA, [illegible] 32° 3' 38'' — 1' 30''; ∠ GCI = 59° 7' 2'' + 1' 30'' [illegible] ∠ ECI = 48° 19' 31'' — 1' 30''); deinde ∠ [illegible] 9° 4' 11'' + 30'' (Keplerus 21'' addit); ∠ CDA [illegible] 10° 14' 15'' [illegible] 30''. Deinde, cum AC = 1 [illegible]

$AF = \frac{\text{sin. } 32^\circ\ 2'\ 6''}{[illegible]\ 8'\ 36''}$ [illegible] 9,7242566 / 9,0[illegible]046 [illegible] AG = [illegible]

= 5,0301 [illegible]

Assumta autem quantitate anguli [illegible], cum Keplero [illegible] Keplero 5,0275, quia sinum [illegible]

$AD = \frac{\text{sin. } 141^\circ\ 0'\ 44''}{[illegible]}$ 9,7987750 [illegible]

[illegible]

Dantur [illegible] unde [illegible] differentibus [illegible]

1) In △ AFG.

$\frac{1}{2}(G + F) =$ [illegible] — 9,9928748

AF — AG = [illegible] — 9,6268815 [illegible]

AF + AG = [illegible] — 1,0412820

$\frac{1}{2}(G - F) =$ [illegible] — 8,8771961

2) In △ ADE.

$\frac{1}{2}(D + E) =$ [illegible] — 10,0[illegible]

AE — AD = [illegible]

AE + AD = [illegible]

$\frac{1}{2}(D - E)$ [illegible]

$$\frac{[illegible]}{10,[illegible]} = 0,07683, \text{ prius } = 0,07662, \text{ diff. } 21$$

$$\frac{0,2[illegible]}{[illegible]} = 0,02875 \quad " \quad = 0,02967 \quad " \quad 88.$$

$$\frac{0,[illegible]}{[illegible]} = 0,04875 \quad " \quad = 0,04426 \quad " \quad 51.$$

$$\frac{[illegible]}{11,1536} = 0,06188 \quad " \quad = 0,06168 \quad " \quad 20.$$

[illegible] differentiis per tangentes angulorum $\frac{1}{2}(G + F)$ &c. multiplicatis, prodeunt [illegible] et decrementa tangentium angulorum $\frac{1}{2}(G - F)$ &c. $= 0,00021$, $0,00067$, [illegible], $0,0001$, quibus respondent augmenta et decrementa arcuum prius inventorum [illegible] 36″, 2° 9′ 52″, 2° [illegible] 24″ et 1° 42′ 41″) 41″, 2′ 14″, 2′ 39″ et 19″, ita ut [illegible] priores arcus: 4° 19′ 17″, 2° 7′ 38″, 3° 54′ 45″ et 1° 43′.

[illegible] eosdem calculum alia ratione absolvamus.

[illegible] $(G + F) =$ 9,9826745	2) lg. tg. $\frac{1}{2}(D + E) =$ 10,1106569
[illegible] $- AG) =$ 0,9268567 — 1	lg. $(AG - AD) =$ 0,[illegible]0124 — 1
[illegible] $+ AG) =$ 1,0613455	lg. $(AG + AD) =$ 0,9848172
[illegible] $=$ 8,6783858	lg. tg. $\frac{1}{2}(D - G) =$ 8,5696521
[illegible] $F) =$ 4° 19′ 19″	$\frac{1}{2}(D - G) =$ 2° [illegible]
[illegible] $=$ 10,1068618	4) lg. tg. $\frac{1}{2}(E + F) =$ [illegible]
[illegible] $=$ [illegible]	lg. $(AF - AE) =$ [illegible]
[illegible] $=$ 1,0019757	lg. $(AF + AE) =$ [illegible]
[illegible] $=$ 8,8349744	lg. tg. $\frac{1}{2}(E - F) =$ 8,4767479
[illegible] $=$ [illegible] 41″	$\frac{1}{2}(E - F) =$ 1° 43′

[illegible] 4° 19′ 19″ [illegible] 1° 43′ [illegible]

2° 7′ 38″ + 3° 54′ 41″ = 6° 2′ 15″

[illegible] a Keplero [illegible] residuum [illegible] pro 10776. Correcte hoc [illegible]

[illegible] $\frac{1}{2}(AEF + AFE) =$ 25. 50. 41

[illegible] $+ AFG + [illegible] AFE) = \frac{1}{2}(AGF + AEE + EFG) =$ 70° 22′ 29″

[illegible] $= \frac{1}{2}(AGF + AEE - EFG) =$ 6. 2. 20

[illegible] 17″ [illegible]

[illegible] sin BGE = 90° — 64° 20′ 9″ = 25° [illegible]

[illegible] (90° 56′ 22″ + [illegible] 18′ 38″)

[illegible]

[illegible] AE — AG = 0,1548

[illegible]

62) p. 249. Prius (p. 246) longitudines mediae [illegible] deinde (p. 248) per 30″, denique hoc loco per [illegible]

Aphelium initio fuit in 28° 44′ ♌, cui addita [illegible] 28° 47′ 20″; cum autem calculus (p. 248) haec [illegible] diminutum per haec 12″ reponitur in 28° 47′ 8″. [illegible] quadrangulum stet in circulo", promovendum esse [illegible] sit in 28° 49′ 8″. Penultimus calculus (p. 249) [illegible] esse, h. e. in 28° 48′ 30″. Ultimus denique calculus [illegible] jam inventus sit locus aphelii in 28° 48′ 55″ ♌.

63) p. 249. In △ BGA dantur anguli BGA [illegible] et radius BG. [illegible]

Initio hujus computationis (p. 249) [illegible] deducta BG = 5,3668 (5,3660 p. 249). Quum [illegible] mentaria, hinc ponit proportionem Keplerus: 5,3668 [illegible]

Jam dantur BG = 1, AC = 0,18884, AB = 0,11[illegible]

64) p. 250. Quum circiter tertia parte [illegible] anguli BGA et BAG [illegible] horum laterum et angulorum [illegible] BA = 0,11332.

Posterior autem numerus falsus est. Nam [illegible] = 0,09919; sin. 62° 8′ 37″ = 0,88414, [illegible]

prodit commisso a Keplero errore [illegible] pro 10776. Correcto hoc errore [illegible] AB = [illegible]

[illegible]



[illegible]

Cum sit H in 146° 42′ 13″
∠ HAF = 82. 13. 26 (29)

erit longit. F 66° 28′ 47″ (44)
h. e. in 6° 28′ 47″ II.

[illegible] sicut etiam reliquae comparantur cum longitudinibus, quas exhibet [illegible] Cap. XV. De Kepleri calculo hoc tantum notamus, multiplicationes peractas [illegible] ea, qua hodie utimur multiplicantes fractiones decimales methodo, quam dicunt, [illegible]

[illegible]) p. 256. Numeri hi non plane iidem e Tychonis tabula computantur. Ad distan- [illegible] ab apogaeo 155° exhibet tabella, quae inscribitur: distantia Solis a Terra in partibus, [illegible] semidiameter eccentrici 100000, numerum 97498, et ad distantiam ab apogaeo 65° [illegible]. Cum autem apogaeum ☉ anno 1585. sit in 3s 5° (28′ 30″), anno 1593. in [illegible] 30″) (Tycho [illegible] p. 67), Sol vero datis temporibus appareat in 21° ♒ et in [illegible] distantiis ab apogaeo tum fuere 134° et 67° p. p. ergo pro 97498 numero, [illegible] exhibet, posuit K. numerum rotundum 97500; sic de Tychonis numero [illegible] fuissent particulae 114, Keplerus pro residuo posuit 101400. [illegible] latere BA = 97500, ∠ BDA = HBD + BAD = 4° 22′ 10″ [illegible] et ∠ DBA = 175° 27′ 50″ (compl. viam [illegible]), erit

[illegible] = 163028, sive assumta BA = 1, DA = $\frac{163028}{97500}$ = 1,672.

[illegible] = ∠ ECL — EAC = 6° 8′ — 1° 35′ = 4° 34′ [illegible] AC = 0,0040980 [illegible] ACE = 9,0228254 [illegible]

[illegible]

71) p. 272. Quantitates angulorum, ad [illegible] desumtae sunt e capite praecedente hunc in modum [illegible] commutationis = 64° 23′ 30″, DFC 36° 51′ (in [illegible] notandum, pro 21° 34′ ♏ ponendum esse 21° 33′ [illegible] △△ FCD et FCE, cognitis duobus angulis, non [illegible] (K. 27″) ∠ FEC = 77° 31′. Quibus datis, [illegible]

$$DC = \frac{\sin. 36° 51'}{\sin. 78° 45' 27''} [illegible]$$

$$= 0,61146 \qquad 0,7[illegible]$$

0,61148 (K.)

$$CE = \frac{\sin. 38° 5' 30''}{\sin. 77° 31'}$$

$$= 0,63190$$

Jam in fig. 75. respondent lineae DC [illegible] et angulus ECD aequat [illegible] quibus addit Keplerus 18[illegible]

Non tam expedite Keplerus [illegible] Vitium? [illegible] EGD 68° 38′, at [illegible] Erroris [illegible], quod „signum" (♌) pro [illegible] corrigit [illegible] foliis 6, eandemque [illegible] calculum Kepleri, qui [illegible] = 0,01835. Manuscripta habent [illegible]

Speculationes [illegible] Keplerus [illegible] cum non succederet [illegible] pragmatiam suspendit, [illegible] Itaque hoc jam agamus; in [illegible] ibi centrum sit aequantis, [illegible] nam differentia non major est [illegible] Solis, turbabitur [illegible] orbis [illegible] tentavi [illegible] in eodem eccentrico [illegible]

[illegible]

72) p. [illegible]

[illegible]

III. [illegible] 1588, iterum [illegible] long. [illegible] 1° 38′ [illegible] $\zeta\alpha$ = [illegible] 21′ 30″ et $\varkappa\vartheta\alpha$ = 96° 22′ 14″, ergo

$$\varepsilon\alpha = \frac{\text{sin. } [\text{illegible}]}{\text{sin. } \varepsilon\varkappa} = 0{,}67794.$$

IV. [illegible] $\varkappa\alpha\zeta$ = 1° 38′ 5″, $\zeta\varkappa\alpha$ = 3° 23′ [illegible] et $\varkappa\zeta\alpha$ = 174° [illegible] 50″

$$\alpha\zeta = \frac{\text{sin. } \zeta\varkappa\alpha}{\text{sin. } \alpha\zeta\varkappa} = 0{,}67479.$$

78) p. 27 [illegible] problema numeros Kepleri, integrum repetimus calculum.

I. In $\triangle$ [illegible] latus $\alpha\vartheta$ = 0,66774, [illegible]η = 0,67467 et $\angle$ [illegible] = 42° 52′ 47″.

[illegible] + $\alpha\vartheta$ = 1,34241

[illegible] − $\alpha\vartheta$ = 0,00693

$\frac{1}{2}(\vartheta + \eta)$ = 68° 33′ 36″

[illegible] $\frac{1}{2}(\vartheta - \eta)$ = 0° [illegible] 11″

$\frac{1}{2}(\vartheta + \eta)$ = 68° 33′ 36″

[illegible]

Deinde assumatur $\alpha\vartheta = 1$, prodeunt: [illegible]

1) $\alpha\delta = \frac{\sin. \alpha\vartheta\delta}{\sin. \alpha\delta\vartheta}$ lg. sin. [illegible]

$= 0,37480$ [illegible]

2) $\alpha\varepsilon = \frac{\sin. \varepsilon\vartheta\alpha}{\sin. \alpha\varepsilon\vartheta}$ lg. sin. [illegible]

$= 0,66682$ [illegible]

3) $\alpha\zeta = \frac{\sin. \zeta\vartheta\alpha}{\sin. \alpha\zeta\vartheta}$ lg. sin. [illegible]

$= 0,66429$ [illegible]

4) $\alpha\eta = \frac{\sin. \eta\vartheta\alpha}{\sin. \alpha\eta\vartheta}$ lg. sin. [illegible]

$= 0,67171$ [illegible]

Keplero prodit $\alpha\eta = 0,67220$ major [illegible] causa nequit proponi. In manuscripto [illegible] vero illi longa [illegible] omnes illos [illegible] Animus [illegible] pro [illegible] semper [illegible] loco [illegible] tatis Terrae . . . Sunt loca [illegible] 0′ 19″ ♓, ♂ 24° 22′ [illegible] 25° 53′ 26″ ♐, ♂ [illegible]

Constitutio angulorum [illegible]

$\delta\alpha\varepsilon = 45° 43′ 12″$ [illegible] (+ 5′ 10″ pro [illegible]) = [illegible]

$\eta\alpha\vartheta = 4° 18′ 24″$, [illegible]

$\eta\vartheta = \frac{\sin. \eta\alpha\vartheta}{\sin. \alpha\eta\vartheta} =$ [illegible]

$\alpha\xi = \frac{\sin. [illegible]}{\sin. \alpha\xi\vartheta} =$ [illegible]

[illegible]

$\alpha\delta = 66152$, $\alpha\varepsilon =$ [illegible]

[illegible]

... ut sidera per 7 plus. ...

$= 1^\circ\ 17'\ 54''$

Secundo momento ...

Tertio momento ...

Quare jam [illegible] novum praestabimus [illegible]
nam etiam [illegible] neglecta praecessione [illegible]
culo, [illegible] succederet [illegible]
pacto [illegible] faciunt? Nempe hoc [illegible]
quantitate, et computabo, quales deb[illegible]
quod eccentricus ♂ non bene [illegible]
pu[illegible]m. Ut tamen certissimus [illegible]
hy[illegible] (calculus). Ego [illegible]
simplicem. Prodeunt 14° 10[illegible]
Quid, si fixae 7' [illegible]
pu[illegible]retur in 17° 47' 45'' ♉ [illegible]
8[illegible] 24[illegible] 7? Ergo [illegible]
pro [illegible]' 35'' fiet 17' [illegible] in 17° [illegible]
quae [illegible] ad 17° 31' [illegible]
17° 36' 43''; diff. 2' [illegible]
$\delta\vartheta\alpha$ 19° 47' 28'', [illegible]
$\alpha\eta\vartheta$ 8° 9' [illegible]
neque vero r[illegible]

76) p[illegible]

Jam datis in △ [illegible]

Secundo momento T[illegible]

Tertio momento $\delta\eta$ [illegible] $\delta\alpha$ [illegible]

D[illegible]
∠ α[illegible]

$\frac{1}{2}(\ldots + \zeta) = 24^\circ\ 45'\ 1'' \div$ [illegible]

$\ldots = 0{,}12846 \quad - 0{,}$ [illegible]

$\alpha\zeta \ldots = 1{,}99252$ [illegible]

$\frac{1}{2}(\gamma - \zeta) =$ [illegible]

calculi in divisione commissi.) [illegible]

$\alpha\gamma\zeta =$ [illegible]

$\zeta\gamma = \frac{\alpha\zeta.\ \sin.}{\sin.\ \vartheta}$ [illegible]

$= 1{,}8095$

5) Anno 1583 locus [illegible]

$\gamma\eta\zeta = 180^\circ$ [illegible]

In [illegible]

1,8095, hinc [illegible]

7) Inde [illegible]

(N. 5) [illegible]

$\frac{1}{2}\ldots + \eta$ [illegible]

$\zeta\eta - \zeta\alpha$ [illegible]

$\zeta\eta + \zeta\alpha$ [illegible]

[illegible] 0,8458181 [illegible]

[illegible] 57. 20.

[illegible] 8. 49. 52.

[illegible] Kepleri [illegible]

[illegible] Deinde [illegible]

[illegible] Denique [illegible]

[illegible] Keplerus totum hunc [illegible]

[illegible] 0,99203 et [illegible]

[illegible]

Doctissime [illegible]

Vidi nu[illegible] insigne tuum opus de [illegible] Martis [illegible] pro nobili [illegible] Venetia allatum, et [illegible] quidem [illegible] breviter, qu[illegible]um per angustiam [illegible]

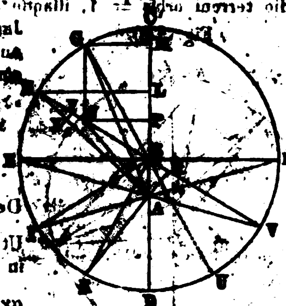
Inter cetera offendi caput 31, positum pag. 164 [illegible] eccentricitatis Solis non turbari sensibiliter aequationes Solis [illegible] cum avide percurrissem inveniissemque, [illegible] tam [illegible] Solis eccentricitate [illegible] [illegible] tabulis ad simplicem Solis eccentricitatem [illegible] reddita secundum hypothesin aequantis [illegible] tandem, te male angulum [illegible] eccentrici centrum in simplici Solis [illegible] tate [illegible], ut ex hac adjecta [illegible]

Sed mirum minime est, homines [illegible] difficillimis speculationibus [illegible] in bonam partem haec accipias [illegible] amici munus gerō. Haud illi[illegible] accidere, quia enim hominibus [illegible] quam diu [illegible] man[illegible] fuerit [illegible] et [illegible]

[illegible] diligentia quaesitum [illegible] Germano, qui ad nos [illegible] „Primum [illegible]" [illegible] titulo et dedicatione [illegible] magnis, quae [illegible] planetarum dimensionem [illegible] certe [illegible] [illegible] d. 1[illegible]

[illegible]

In felicitatis parte est, quod [illegible]
ita ut excerpta ex libro [illegible]
aequales partes aequationis opticam [illegible]
[illegible] plane aequales; quod vero [illegible]
prosthaphaeresis non obtineri [illegible]
dicas, ut potius per hanc tuam [illegible]
ipse in his literis ex mea tabula ad [illegible]
ad 135° — 1° 26′ 26″? At quid [illegible]
Miraberis, quae haec praestigiae? [illegible]
aequationis connectantur ad gradus [illegible]
sed sequenti. [illegible]
quasi optica anom. coaeq. 45°, [illegible]
per duplicationem opticae. [illegible]
Cogita, an haec mihi [illegible]
cum [illegible], aliam postea [illegible]
Nam hanc non vacat [illegible]
Ut erroribus hic [illegible] nihil [illegible]
totum [illegible]
sph[illegible]
ve[illegible]
non [illegible]
sunt in Hipparc[illegible]
T[illegible] Mar[illegible]
ut unum aliquis [illegible]
com[illegible]
[illegible]

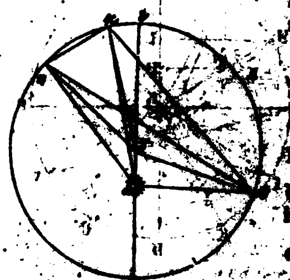


chordis ad diametrum perpendicularibus, [illegible] [illegible] diametri terminum conjungentem cum illo puncto. [illegible] terminatio, = a, numerusque sectionum = n [illegible] [illegible] r = cos. $\frac{1}{2}$ a [illegible] [illegible] $\frac{\cos. \frac{1}{2} a}{\sin. \frac{1}{2} a}$ = [illegible]

Haec ad Kepleri propositionem referentis, [illegible] [illegible] sin. 180° = cot. [illegible] Rationem hanc Keplerus paucis explicat [illegible] Fabricio [illegible] praecedentem p. 105.

87) p. [illegible]. Caput 42 (p. 338) [illegible] radio terreni orbis = 1, illaque reducta [illegible]

Fig. [illegible]



Jam in △ εγ [illegible] [illegible]

[illegible]

[illegible] (anguli) oppositi in parallelogrammo [illegible] $\angle \nu =$ [illegible] $\chi\varphi$, $\beta\nu = \beta\xi$, [illegible] cum sit $\tau\chi = \xi\varphi$, $\beta\tau =$ [illegible] et $\angle$ [illegible] cum sit $\beta\varphi$ [illegible], erit $\beta\chi - \beta\xi =$ [illegible] $\varphi\chi = \xi\varphi = 2\alpha\nu$.

[illegible] circuli $\varphi\tau$ circa β descripti (9) et $\tau\chi$ [illegible] $= \varphi\chi$ [illegible] $\varphi\chi^2$. $\angle \varphi\chi\tau = R$, ergo $\chi\varphi^2 + \chi\tau^2 = \varphi\tau^2 = \alpha\beta^2$ [illegible] $\beta\varphi\,(\beta\varphi - \beta\xi) = \beta\varphi^2 - \beta\varphi \cdot \beta\xi = \beta\varphi \cdot \xi\varphi$.

[illegible] $\beta\xi$ semiaxibus ellipseos $\lambda\varkappa\delta\xi$ (fig. [illegible]), quibus tangit circulus $\lambda\theta\delta\varphi$, [illegible] ellipsis [illegible] $C : E = \beta\varphi^2 : \beta\varphi \cdot \beta\xi$

$C - E : C = \beta\varphi^2 - \beta\varphi \cdot \beta\xi : \beta\varphi^2 =$ [illegible]
$=$ circ. radio $\alpha\beta$: circ. rad. $\beta\varphi$ descriptum (C).

[illegible] $=$ 2 lunulis $\lambda\theta\delta D$, ergo 2 lunulae $\lambda\theta\delta D$ aequant circulum, cujus radius $\alpha\beta$; [illegible] brevior substituatur ellipsis, sed insensibili ab ea differt, superat [illegible] descriptus insensibili lunulam utramque [illegible].

[illegible] junctis punctis ξ et [illegible] triangulum $\xi\varphi\tau$ simile [illegible], unde
$\beta\varphi : \varphi\tau = \varphi\tau : \xi\varphi$ et hinc [illegible] $\beta\varphi \cdot \xi\varphi =$ [illegible]

[illegible] $\beta\varphi = 1$, $\varphi\tau = \alpha\beta = 0{,}09264$; ergo $\xi\varphi = 0{,}09264^2 = 0{,}00858$.

[illegible] cujus radius $\beta\varphi$ est, $=$ C, circulus, cujus radius $\alpha\beta$, [illegible]

[illegible] $= 0{,}00858 \times 3{,}1416$ [illegible]
$= 0{,}02695$ [illegible]
$C = 3{,}1416$ [illegible]
[illegible] $= 3{,}1416$ [illegible]

[illegible] $= 3^{\circ}\ 18'\ 28''$, [illegible] 3,1416,

[illegible] $= 0{,}3817$ [illegible]

[illegible] $= 0{,}04632$ [illegible] $= 90^{\circ}$, [illegible] $\triangle$ [illegible]

[illegible] $= \frac{1}{2} \cdot 3{,}1416 =$ [illegible]

[illegible] $=$ [illegible] $+$ [illegible] $=$ [illegible]

[illegible] rectangulo [illegible] (distantia [illegible]) [illegible]

[illegible] $8^{\circ}\ 43'\ 18''$ [illegible]

[illegible] (medium [illegible] $2'\ 30''$ et [illegible])

[illegible] $8'\ 20''$ [illegible]

[illegible] $10^{\circ}\ 47'\ (10)''$ [illegible]

92) p. 374. [illegible] in △△ [illegible]
DA, GA, FA et EA; anguli ad D, G, F et E [illegible]

Anno 1589 locus ♂ K in 10ˢ 15. 25. 53 [illegible]
☉ A in 8. 21. 44. 56

∠ AGK = [illegible] 53. 40. 57

Anno 1591 locus ♂ in 1[illegible] [illegible]
☉ in 7. [illegible] 45

∠ AGK = [illegible] 48. [illegible]

Anno 1593 locus ♂ in 11. 8. 55. 01
☉ in [illegible]

∠ AFK = 1[illegible] 12. 51
compl. 16. 47. [illegible]

Anno 1595 locus [illegible]
☉ in [illegible]

∠ [illegible]
compl. [illegible]
DK in 10ˢ 15. [illegible]
∠ DKA = 34. 39. 26

AK in 11ˢ 20. 5. 16
FK in 11ˢ 8. 53. 51
∠ FKA = 12. 0. 4

[illegible]

93) p. 379. Ratio, qua Keplerus [illegible]
D. 24. Nov. 1582.
Sol (βα) in ♋ 11° 40′ 49″ [illegible]
♂ (βϑ) in [illegible]

αβϑ = 135. [illegible]
αβ [illegible]

[illegible] (distantia [illegible] Spica) [illegible]
βϑα = [illegible]

$$\alpha\vartheta = \frac{0,65645 \times [illegible]}{\sin.\ [illegible]}$$

= 1,[illegible]

[illegible] 39″ et [illegible]
(distantia [illegible])
[illegible]

αϑη = [illegible]

[illegible]

[illegible] promissione illa facta, retinui [illegible] ad animum [illegible], in cujus solius gratiam hanc mutationem eram facturus. [illegible] curas injecerunt observationes Waltheri, prae quibus haec [illegible] obliviscor. (E literis datis anno 1624.)

[illegible] dicit Keplerus (p. 17) locum Martis ad d. [illegible] Dec. [illegible] [illegible] tabulis Keplerus supputavit ipsum [illegible] unde [illegible] latit. bor. 4° [illegible] [illegible] in [illegible] 21° [illegible] 14' [illegible] latit. [illegible] 4° 44' [illegible]

[illegible] In imagine ad schema 114, hi sunt adjecti versus:

Caeca mari signas nautis vestigia, magnes:
Quid mirum, errones [illegible] ire tuis?

[illegible] est, circulum DFA nigrum esse in originali depictum, quasi [illegible] in [illegible], prope ad hunc circulum, nauta naviculam gubernet. — Verba [illegible] de Magnete, Cap. [illegible] in [illegible] VI cap. [illegible]

[illegible]) p. 391. Desumsit haec Keplerus parum mutata e literis ad [illegible] scriptis [illegible] Oct. 1605, quas praefatio nostra exhibet (p. 105). Adscripsit, ut ille, [illegible] ipse [illegible] ad hunc locum epistolae „NB. refer in Commentaria [illegible] Comm." lib. V. p. 657 Keplerus [illegible] locum corrigit: [illegible] theorematis per numeros et [illegible] vide [illegible] Cap. LVII. Ibi [illegible] videbatur haec proportio [illegible] [illegible] satis parvi; quod [illegible] [illegible] Tunc [illegible] latitudo necessario prodiret dupla ejus, [illegible] — [illegible] (Collect. Math. lib. VIII) [illegible] sphaericum plano parallelo [illegible] proportione semper eadem," [illegible] ad sinus [illegible] = 180°, et [illegible]

[illegible]

$= 1 + … \cos x + …$

Cum sit in $\triangle$ HNE ad H rectangulo, HE = …
$NE^2 = 1 + … \cos x + … \sin …$ Quae …

96) p. 404. Theorematum, quae praemisit … inscriptorum „protheoremata" pătera I—XI. … literis expressa. Reliqua (XII—XV) … hanc …

Sint R, r, semidiametri ellipseos; C, E arcus … natae respondentes circuli et ellipseos; A, a, … MNA (fig. 118) …

erit I. …

II. …

III. …

IV. Multiplicatio … in … majorem ellipseos diametrum … aequalis est.

V. …

VI. …

VII. Si BN = R, erit HN …



… rione semper eadem, …
… sinus acutum.
… = 180°, et …

… cot. …
… = 0 et hinc …

[illegible] In △ VHD (Fig. 120) sit ∠ V = 90°, ∠ VHD = [illegible], HD = 1. [illegible] EH : KL = EB : HM, ut EB = 0,00[illegible], [illegible] = 0,00432 × sin. 45° [illegible] KD — FD = sin. 45° (1 — 0,00432) [illegible] = 0,99568 . sin 45°

$$\text{tg. VHF} = \frac{0{,}99568 \times \sin. 45^\circ}{\cos. 45^\circ} = 0{,}99568$$

[illegible] ex formula annot. 101, calculus sic se habet:

$$\cos. \text{MNL} = \frac{e + \cos. \text{KA}}{1 + e \times \cos. \text{KA}}, \text{ prodit}$$

$$\cos. \text{MNL} + \cos. \text{MNL} \times e \times \cos. \text{KA} = e + \cos. \text{KA}, \text{ et inde}$$

$$\cos. \text{KA} = \frac{e - \cos. \text{MNL}}{\cos. \text{MNL} \times e - 1} = \frac{\cos. \text{MNL} - e}{1 - e . \cos. \text{MNL}}$$

[illegible] p. 410. Ratio calculi Kepleri ad haec redit: Sit eccentricitas NH = e, ∠ LHM [illegible] = a, HK = 1. Deinde, cum sit MN major radio quantitate [illegible] MN per 1 + x; sic linea LH per y, eritque

$x : y = \frac{e}{2} : 1$, quare

$y = \frac{2x}{e}$ [illegible]

[illegible]

aequata vero MNA angulus. Data media AKN, ... acquiri anomaliam AK aliter quam per ... sinum KL, multiplico in valorem arcus ... [prodit hic valor ex multiplicatione EH ... paratione facta ad aream circuli, quam ... mihi prodit area KHN in scrupulis secundis ... seu aream AHK [quia eadem jam est ... datam anomaliam mediam, tunc bene possit AK ... ego jam construxi, jam nulla est amplius ... excerpitur. Sed ego jam versor in ... cum aliquam. Data arcu AK et LH, qui ... Ducta KH ejusque perpendiculari NT, erit KT ... N Sole. Nam KT et MN sunt aequales. ... in hoc schemate etc. LK et LH ... Jam igitur habetur MN, NT et ...

Haec ideo jam, quia recolligo memoria ... primo quod putabas, incongrue a me dictum, ... sunt lineae, deinde, quia magis tibi arrisit ratio ... Demonstratum habeo, distantias duas punctorum ... aequare diametrum EH. Secto igitur circulo AK ... constituentur totidem sectores, qui implent ... area circuli omnibus suis sectoribus. Atqui ... KT, TI, id est KH, HI, duos sectores, et sic ... aequales cum illis [in summa] longitudine, ... habere latitudinem sectorum, re ipsa ... calo vera etiamnum est ... M, Y etc. distantias eam ... retineo, quia in effectu est ... dem lineas, ... sicas causas exprimit. Cum enim ... area metiens ... se singulas ...

Jam ad Fab... retinet AK circulum, ... librationi dicit MDF ... sic et HA, DG, ... GDF, ... Id prope ... non ...

[illegible] potius manet in simplicitate, computans DMN, sed non perpendit, sibi [illegible] longiorem quam HN. Itaque [illegible] aequa-[illegible] supra quidem et infra quadrantem. [illegible] in cal-[illegible] sinus. Sed etsi admoneatur, nullum habet compendium; [illegible] multiplicatione citra sinuum tabulas prodit valor areae KHN. Ipsi [illegible] HD, altera per tabulas sinuum et tangentum HND, tertia per [illegible], nisi et vitiosam aequationem et vitiosam distantiam HN, quae [illegible] orbis, velit exstruere.

[illegible] incertitudine prima propter insensibilem errorem. Ducit enim [illegible] pro habenda HD, cum ergo sint GH, 1 et AK [illegible] sed per KT, i. e. per NZ in NM transpositam [illegible]

[illegible]

$$\tfrac{1}{2}(C + L) = 87^\circ\ 19'\ 16'';$$
$$AL - AC = 0{,}[illegible];$$
$$AL + AC = 2{,}[illegible];$$

[illegible]

Hinc ut supra: sin. lat. visae = $\frac{\text{sin. } [illegible]}{\text{sin. } [illegible]}$ [illegible]

107) p. 430. Redit Keplerus ad hanc [illegible] rem quidem aliquantum accuratius inspiciens, [illegible] tempore, quo librum hunc conscripsit (anno 1604), [illegible] quanquam [illegible] lector ea, quae in Comment. Martis Cap. LXVIII. [illegible] quamque invenies differentiam, [illegible] opportunam tribuat.

[illegible] ad Fabricium [illegible] principio inaequalis, [illegible] aequalis. Ergo [illegible]

[illegible]

instituerint, nacti Principem profuse liberalem. Nam [illegible] Ptolemaei tot [illegible] [illegible] motum apogaei [illegible] ciderunt; hoc si [illegible] a Ptolemaei observationibus [illegible] circa 15° [illegible] habuisse [illegible] apogaeum [illegible] formula [illegible] quod 20 aut 21° II. [illegible] nonis, cum [illegible] ante 150 circiter annos [illegible] locum in [illegible] hinc [illegible] apogaeum ac tempora [illegible] ex [illegible] [illegible] qui stellas fixas [illegible] signiferum suo motu promoveri demonstrat. [illegible] igitur, si secundum istam analogiam apogaei motum [illegible] ab Albategnio [illegible] [illegible] reperiatur [illegible] [illegible] in [illegible] [illegible] fuit [illegible]

[illegible] (p. 451) [illegible] ex [illegible] inquirit. Comp. Vol. II. [illegible] Vol. I. p. [illegible]

[illegible] p. [illegible] In Almagesto Ptolemaei [illegible] [illegible] lib. X. cap. [illegible]

[illegible]

MENTA STUDIORUM KEPLERI ASTRONOMICORUM.

TA E MANUSCRIPTIS KEPLERI, QUAE PRIUS OPOLI, JAM PULKOWAE CONSERVANTUR.

PROOEMIUM

[illegible] in praemissis operum Kepleri voluminibus occurrit mentio operis, [illegible] conscribendum sibi proposuit Keplerus, inscribendumque censuit Hip[illegible] [illegible] Volumina I. et XV. Manuscriptorum Pulkovensium exhibent [illegible] per multos annos Keplerus in his studiis profecit, cum ad formam [illegible], quae ad typum apta videtur, tum eundem plane perfecta et [illegible] ad aptius tempus reservata, tum denique fragmenta tantum, [illegible] ac cohaerentia raptimque conscripta, ut in mentem venerunt, [illegible] quo conscripta sunt, velut signo ad revocandam [illegible] [illegible] Testimonium praebent haec fragmenta cum indefessae Kepleri [illegible] diligentiae, tum peculiaris [illegible] rationis, [illegible] ad eandem rem, si primo impetu eam [illegible] [illegible] donec ad exoptatum venit finem [illegible] ut ipse [illegible] conficiendi calculi [illegible] [illegible] hac summa certum se [illegible] quam [illegible]

[illegible]

praebent conatuum rem ulterius continuandi, [illegible] mata digitum intendunt ad praemissa, omissis [illegible] culi multiplices his additi sunt ad inceptum [illegible] plane deseritur.

Si ex his, quae praesto sunt, exemplis, si [illegible] et comparatis iis, quae ipse affert de ratione [illegible] Martis (comp. literas Kepleri ad Maestlinum, [illegible] fatione ad hoc opus) si ex his concludere licet de [illegible] Keplerus, non sine veritatis specie haec [illegible] quaecunque occurrebant [illegible] scripsit saepius, praeter diem quo lucubrationes [illegible] urbem, v. g. „Monachii", „Pragae", „Tubingae" [illegible] nomica et in otio, extemplo ubi posset chartis [illegible] ad amicos datas dubitationes, quae occurrebant, [illegible]

[illegible]

[illegible] collectioni inscriptae: Uranologion, sive Systema variorum autho-[illegible] sphaera ac sideribus eorumque motibus Graece commentanti[illegible] 1630). Unum fere habemus testem de Hipparchi astrono-[illegible], qui illius observationibus et hypothesibus fundamenti [illegible] his librum suum, quem dicit [illegible], ab [illegible] nostra tempora notum sub titulo Almagestum. Passim his [illegible] Hipparchi maximis additis laudibus. Libri V: capitibus 11—15 [illegible] Solis, Lunae et Terrae diametros &c. comparat Ptolemaeus, [illegible] quod supra dictum est „diagramma Hipparchi" (Comp Fig. 1, [illegible] theoriam constituens horum corporum.

[illegible] in sequenti libro hanc theoriam, subtilioribus adjutus obser-[illegible] conatus est, rem vero, quamquam iterum iterumque ad il-[illegible] imperfectam reliquit, deficientibus observationibus accurationibus, [illegible] ipsi praesto fuere, nondum sufficerent. Ipse Keplerus [illegible] in operibus suis et literis privatis dicit nunc conscri-[illegible] quasi conscriptam, quam ob rem multi aequalium opus [illegible] vel non obtinuisse legendum aegre ferre se publice [illegible] Jeremias Horroccius inter hos primus dicendus est, [illegible] doctrinaeque subtilitatem, tum ob singularem quam exhibuit [illegible], quam testantur ea, quae infra sequuntur, quaeque [illegible], quem edidit Joannes Wallis, „Geometriae pro-[illegible]" et inscripsit: „J. Horroccii, Liverpolensis [illegible], Opera posthuma. Videlicet: Astro-[illegible] [illegible]

[illegible]

[illegible]antiam, cum non posset ad regulas redigere, In [illegible] [illegible], numeros suos exacte esse constitutos [illegible] „tabularum numeros solos esse in culpa", differentiam [illegible] sas accidentarias conjiciendam esse, sed ex observationibus [illegible] servationes priorum, Ptolemaei, Waltheri, Regiomontani, [illegible] [illegible] [illegible], „non esse [illegible] [illegible] [illegible] [illegible] [illegible] tanquam omni exceptione majora venditamus" [illegible] [illegible] hanc esse dicit, quod „magni viri inventis [illegible] tionem strictim enarrant, processum autem, quem in [illegible] candide dissimulant. Longe magis ingenue Keplerus [illegible] nes, sed et modum observandi candide nobis [illegible] illius observationes sint aliorum omnium certiores. [illegible] Illius igitur exemplo omnes admonitos velim, ut [illegible] non invideant; sit licet paulo plus laboris [illegible] nunquam tamen poenitebit veritatem [illegible] [illegible]

Deinde [illegible] recensentis, quae [illegible] [illegible] [illegible] maxima ex parte Kepleri secutus Ep[illegible] [illegible]: haec apud lectorum praefari volui, ut [illegible] [illegible], quod hic non [illegible] [illegible] [illegible] [illegible] [illegible] O. M. [illegible] grates ago, quod [illegible] veritatem amplectendam concesserit.

His similibusque [illegible] in Kepler[illegible] a primo exordio Lansbergii [illegible] [illegible] Kepleri [illegible] [illegible] [illegible]. In [illegible] [illegible] [illegible] ipsum Solis [illegible] cum prope Solem, ut [illegible] [illegible] [illegible] [illegible] locum cessit veritati." — Sic [illegible] [illegible]

[illegible] omnino est, verum Solis a Terra distantiam [illegible]

[illegible] illustraturus illud diagramma brevi commentario, quod [illegible] [illegible] ad umbilicum perduxit" haec praemisit: HIPPARCHUM [illegible] desideratum, nondum mihi contigit videre, forte quis nondum [illegible] praesumere ausim, totam hanc artem in illo libro [illegible] [illegible] auctoris mortem nunquam non praemissurum [illegible] [illegible] Ubi sit effectum operis, ut ipse testatur, in praeceptis Tabu- [illegible] prodiit ex Hipparcho suo deductis, quae sunt omnino [illegible] hypotheses ejus inde exstructae omnium solae geometriae et [illegible], unde satis intelligenti est manifestum, Keplerum unicum [illegible] solidam habuisse notitiam. Facile est, a praeceptis suis totam [illegible] hac ex parte est, quod in Keplero desideres praeter demon- [illegible] autem jam tibi exhibeo etc.

[illegible] Hipparchi, pergit Horroccius, est inventum ingeniosissimum, cujus [illegible] Lunae et umbrae Terrestris semidiametri et parallaxes geometrice [illegible]. Dicitur Hipparchi, quoniam is (teste Theone) peculiarem [illegible] conscripsit, et ex illo magnitudines et intervalla Solis [illegible] demonstravit. Primus, quod igitur, diagrammatis hujus auctor et [illegible] HIPPARCHUS Samius, mathematicus eximius et astronomiae [illegible] motu sectator, annis 160 a. n. Ch. in Graecia florens. [illegible] [illegible] magnitudinibus et intervallis Solis et Lunae [illegible]

[illegible]

disputans de Solis distantia et parallaxi, [illegible] nem, quae inquisitio desideratur. Huic enim [illegible] cidit, cum non absolutam reliquerit illam auctor, [illegible] Horroccius, teste Wallisio, d. 3. 13. Jan. 1641, [illegible] communis sequutum", paucis tantum annis [illegible] teste, „c. annum 1633 animum ad haec studia [illegible] Lansbergio, [illegible] Kepleri operibus totum se Keplero dedidit, [illegible] ipsi [illegible] ac majora [illegible] juvenili [illegible] Lansbergium refutandum sibi [illegible] disquisitionibus, quae supersunt, [illegible] redactas meliorem in formam [illegible] mundi systema innixum Kepleri hypothesibus [illegible] nominis, hominis juvenis excellentissimi [illegible] posthuma. Hevelius scilicet, [illegible] inscriptum „Mercurius in Sole visus", [illegible] (d. 24. Nov. st. v.), [illegible] a. d. Horroxio, [illegible] de hoc libello [illegible] juvenis [illegible] Horroccium [illegible] (1640) [illegible]

[illegible]

[illegible] illa totalium, haec partialium Telluris [illegible] comparatione, advocatis in subsidium [illegible] momentis, praecipuas eclipsium Terrenarum [illegible] ad quodvis novilunium investigare docuit. Cum vero [illegible], ut semidiametrorum disci Terreni, [illegible] Terrenae eclipseos elementorum determinatio [illegible] inciderentur, id ipsum ex diagrammate Hipparchico [illegible] in opere, cui nomen fecit Hipparcho, ubi plus fere [illegible] humanum ad cognitionem operum Dei viam [illegible], [illegible]. Ipsa vero calculi capita etiam exhibet Riccciolus in Astronomia reformata [illegible], in quo [illegible] modo diagrammatis partes aliquas [illegible]. Quemadmodum etiam Keplerianis ulterius excolendis [illegible] aliquod [illegible] Bullialdus, Paganus, Wardus, Horroccius aliique his recentiores, [illegible] nec spatii nec instituti ratio permittit. Redeo potius [illegible], in quo [illegible] diagrammatis demonstrationem [illegible] Copernicanae promiserat. Sed temporum suorum injuria [illegible] suum in lucem edere non potuit, [illegible] Imp. Matthiae [illegible]. Hipparchus [illegible] duas partes dividitur, [illegible]

[illegible]

fecisse Hipparchi. In Optica (II. 362) librum hunc dicit [illegible] continet restitutionum Lunarium ex eclipsibus. [illegible] haec dedit Reinhardus Zieglerus Moguntinus [illegible] certe tuis Paralipomenis ea usus es ingenii felicitate [illegible] facis Hipparchum tuum quam avidissime [illegible] atque etiam, ne patiaris exspectando mathematicorum [illegible] hoc deliquio, Hipparchum illum tuum diutius publico [illegible] dicit eam, quam anno 1605 publici juris fecit [illegible] de Solis deliquio d. 12. Oct. 1605.)

Quibus Keplerus (d. 14. Feb. 1606) haec [illegible] [illegible] est, quam limatissimum prodire, ne [illegible] susceptam fecerit.

[illegible] anno 1606 (d. 19. Jul.) Herwart [illegible]

[illegible]

[illegible] geometricis jucundissimis, quibus quantitas diametri umbrae cum pa[illegible] Solis et Lunae et semidiametro Solis arctius connectitur; quod [illegible] fuit neglectum ab artificibus. —

[illegible] facientes huic introductioni, antequam ipsum lectoribus proponimus fragmentum, [illegible] partem epistolae Kepleri ad Vincentium Bianchium (alias: [illegible]; comp. Hansch. p 600. 603) datae, ut ipsius verba testimonio sint eorum, [illegible] de Kepleri studiis et lucubrationibus.

[illegible] (cunctationis in operibus, quae sub manibus habebat) excusationes multae [illegible] variae. Primum calamitates aulae sub Rudolpho, turbatum statum [illegible] mala domestica, quibus per aliquot annos sum impeditus (scripsit [illegible] a. 1619), non teneor praestare. Quorum externorum praecipuum [illegible], cum adscriptum mihi sit salarium sane quam honestum a [illegible] non solvitur; nisi a communitate hujus provinciae [illegible] acciperem, ne domum quidem sustentare possem, sed du[illegible] dedecore principum extraneam opem implorassem. Ex hoc sequi[illegible] amanuensem alo et calculatorem. Est mihi jam sedulus [illegible] matheseos capax, Janus Gringalletus Sabaudus, qui [illegible] in annos multos calculare posset in meis aedibus: at cum [illegible] possim desertus a Caesareanis, de diuturna ejus praesentia [illegible] sum. Rursum igitur in me solum recident omnia; neque [illegible] scribendis epistolis interdum sufficio, nedum ad calculatio[illegible] et aliquae morarum causae in meo ingenio: „non omnia possumus [illegible] neque ego ordinem tenere possum: extemporaneus sum [illegible] et si quid ordinatum a me proficitur, decies id repetitum [illegible] error calculi ex properatione commissus longis[illegible] remoratur. Possem sane infinita effundere; nam etsi [illegible]

[illegible]

HIPPARCHUS

SEU

DE MAGNITUDINIBUS ET INTERVALLIS [illegible] SOLIS, LUNAE ET TERRAE

Haec Pragae inchoata a multis annis [illegible]
[illegible] potentibus [illegible]
Lincii vero magna parte continuata [illegible]

[illegible]

[illegible]

Angulus parallaxeos [illegible] et angulus dimidii [illegible] angulum semidiametri Solis [illegible] Centro A [illegible] centri [illegible] AD [illegible]

[illegible]

[illegible] crescit summa ex semimucronibus umbrae Terrae [illegible] parallaxibus Solis utrinque collecta.

Theorema II.

Angulus parallaxeos puncti cujuslibet in supremo margine umbrae Terrae in horizonte positae aequat angulum apparentis semidiametri umbrae Terrae, quae semidiameter est apud illud punctum, et angulum dimidii mucronis umbrae Terrae junctos.

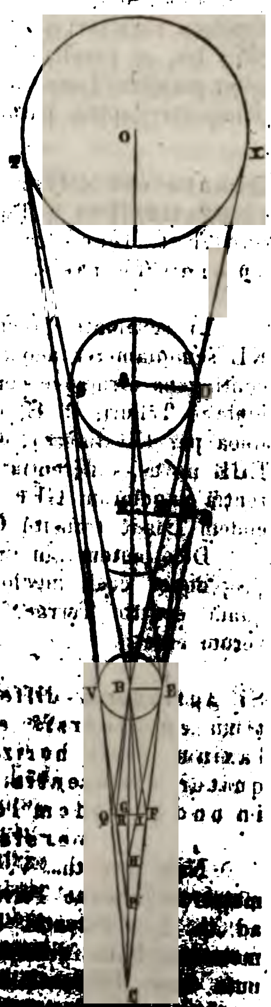
In schem. priori sumatur lineae EC punctum [illegible] quo descendat in BC perpendicularis FG, [illegible] connectantur F cum B et G cum E. Igitur [illegible] FBC, producto latere CF, erit exterior EFB [illegible] interioribus et oppositis FBC, FCB junctis. [illegible] anguli EFB et EGB sunt ad omnem sensus [illegible] aequales. Quare etiam EGB = ECB [illegible] Est vero EFB (EGB) parallaxis puncti [illegible] margine umbrae orientis vel occi- [illegible] FE tangit corpora Telluris et Solis [illegible] ita vim in E posito eadem FE sit [illegible] et FBC, h. e. FBG est angulus in [illegible] apparentis semidiametri umbrae FG, [illegible] F ductae; sicut FEG est angulus [illegible] ex E puncto horizontis visae, [illegible] sensum aequalis angulo FBG. [illegible] est ECB est angulus dimidii [illegible] q. e. d.

[illegible] Parallaxis Lunae horizontalis [illegible] [illegible] Terrae et ejusdem dimidium [illegible]

Theorema III.

[illegible] parallaxes Solis et puncti certi [illegible] Terrae in horizonte positam, [illegible] semidiametri Solis et [illegible] in punctum [illegible] junctis. [illegible]

Fig. 1.



[illegible]antiam, cum non posset ad regulas redacere, In [illegible] persuasus, numeros suos exacte esse constitutos. [illegible] „tabularum numeros solos esse in culpa“, differentiam [illegible] sas accidentarias confiçiendam esse, sed ex observationibus [illegible] servationes priorum, Ptolemaei, Waltheri, Regiomontani, [illegible] esse [illegible] exactissimas, „non esse [illegible] [illegible] nisi viris tanquam omni exceptione majoris [illegible] [illegible] hanc esse dicit, quod „magni viri inventis [illegible] tionem strictim enarrant, processum autem, [illegible] candide dissimulant. Longe magis ingenue Keplerus [illegible] nes, sed et modum observandi candide nobis communicat [illegible] illius observationes sint aliorum omnium certiores. [illegible] Illius igitur exemplo omnes admonitos velim, ut [illegible] non invideant; sit licet paulo plus laboris, [illegible] nunquam tamen poenitebit veritatem [illegible]

Deinde [illegible] recensui, quae [illegible] moverunt, [illegible] ferret, maxima ex parte Kepleri secutus Epitomen Astr[illegible] das: haec apud lectorem praefari volui, ut gratias [illegible] [illegible] quod hic non [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] Q. M. [illegible] [illegible] veritatem amplectendam [illegible]

His [illegible] in Keplerum [illegible] a primo exordio Lansbergi [illegible] [illegible] Kepleri [illegible] [illegible] [illegible] [illegible] [illegible] Solis [illegible] [illegible] [illegible] locum [illegible] [illegible]“ — Sic [illegible] [illegible]

Theorema VII.

[illegible] certa quantitate anguli apparentis semidiametri [illegible] et suppositis diversis sub eodem angulo elongationibus ejusdem a Terra, quantum minuitur parallaxis Solis in suppositione majoris elongationis, tantundem minuitur et semidia[metrorum] [illegible] umbrae in quolibet transitu Lunae per eam.

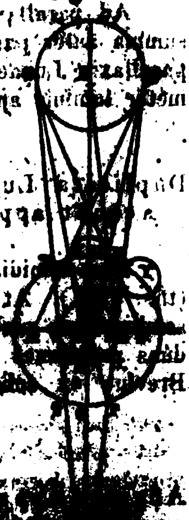
[illegible] in schemate nostro SBD vel TBX unus et idem angulus [illegible] et supponatur Solem a Terra distare vel brevius per BA, vel longius [illegible], et ducantur contingentes SVC, TVP. Igitur in △ STV exterior [illegible] aequalis est junctis STV et SVT, id est CVP. Sed BSV est paral[laxis] Solis propioris suppositi; et BTV est parallaxis Solis remotioris [illegible] manente eodem apparentiae angulo in centro B. Denique PVC [illegible] semidiametrorum umbrae in eodem transitu Lunae, quae sit FGQ [illegible] V), quia TV producta fit interior (VP), secans GQ in R, et [illegible] semimuero umbrae a Sole ut remotiore, SCA vero semi[illegible] ut propiore. Ergo quanto minor est VTB parallaxis, quam [illegible] etiam minor est RBG angulus semidiametri umbrae a Sole ut [illegible] quam QBG ejusdem a Sole ut propiore. Q. E. D.

[Coroll]arium. Quanto minores supposueris parallaxes Solis, tanto [illegible], si pro differentia semidiametrorum umbrae in uno certo loco [illegible] adhibeatur differentia semidiametrorum Solis apparentium [illegible] ex Solis eccentricitate [illegible]).

[illegible] Laminis vocabulo utemur tech[nico] [illegible] Terrae [illegible] parte illa, quae [illegible] Terram, [illegible] umbra [illegible] coni pars [illegible], altera [illegible] desinens). Nam si abit Luna tota [illegible], totam Terrae [illegible] Soli obver[illegible]

[illegible]

Fig. 2.



disputans de Solis distantia et parallaxi, inquisitурus [illegible] n e m, quae inquisitio desideratur. Huic enim disputationi [illegible] cidit, cum non absolutam reliquerit illam auctor, [illegible] Horroccius, teste Wallisio, d. 3. 13. Jan. 1641, [illegible] cesimum secundum", [illegible] tantum [illegible] in [illegible] teste, "c. [illegible] 1633 [illegible] ad haec studia [illegible] Lansbergio, [illegible] aliorum astronomorum [illegible] lectis Kepleri operibus totum se Keplero dedidit, et [illegible] astronomia [illegible] ejus [illegible] majore [illegible] juvenis [illegible] Lansbergium refutandum sibi [illegible] disquisitionibus quae supersunt astronomicis, quas [illegible] redactas meliorem in formam politioremque [illegible] mundi systema [illegible] Kepleri hypothesibus [illegible] [illegible], homen juvenis excellentissimi [illegible] [illegible]. Hevelius scilicet, astronomus ille Dantiscanus [illegible] inscriptum „Mercurius in Sole visus", cui [illegible] (d. 24. Nov. st. v.), [illegible] tractatus astronomicus [illegible] [illegible] a [illegible] Horroxio, [illegible] [illegible] in hoc libello [illegible] [illegible] juvenis [illegible]) Horroccius [illegible] quod anno sequente (1640) ab ipso [illegible] [illegible]

[illegible]

[illegible] totalium, hanc partialium Telluris eclipsium [illegible] comparatione, advocatis in subsidium [illegible] momentis, principales eclipsium Terrenarum phases, magnitudines, [illegible] ad quodvis novilunium investigare docuit. Cum vero [illegible] semidiametrorum disci Terreni, umbrae [illegible] Terrenae eclipseos [illegible] determinatione [illegible] ipsum ex diagrammate Hipparchico praestare [illegible] in opere, cui nomen fecit Hipparcho, ubi plus fere [illegible] humanum ad cognitionem operum Dei viam [illegible] opera [illegible]. Ipsos vero calculi [illegible] etiam exhibet Ricciolus in Almagesto refor[illegible] in quo [illegible] diagrammatis partes aliquas [illegible]. Quemadmodum etiam Keplerianis ulterius [illegible] tempus aliquod [illegible] Bullialdus, Paganus, Wardus, Hevelius aliique his recentiores, [illegible] hic [illegible] nec spatii nec instituti ratio permittit. Redeo potius [illegible] in quo [illegible] diagrammatis demonstrationem [illegible] Copernicanae [illegible]. Sed temporum [illegible] injuria [illegible] hactenus in lucem edere non potuit, utut Imp. Matthiae [illegible] exhibitum. Hipparchus in duas partes divisus, quarum [illegible] quae ad doctrinam eclipsium [illegible] generalibus opticae theorematibus [illegible] inter alia agit de figura [illegible] dimensione refractionum, de parallaxibus, de dispersione lucis siderum [illegible] lucis Solaris in Lunam, Lunae in Terram, et Terrae in [illegible] Ptolemaica [illegible] digna pro[illegible] Lunae observandis, de motu Lunae diurno et horario in [illegible] de [illegible] quo Lunae parallaxi [illegible] observationi [illegible] Sole [illegible] in [illegible]

[illegible]

Conjice in unam summam semidiametrum [illegible] horizontalem et semissem de parallaxi Solis [illegible] semidiametrorum disci et penumbrae.

Theorema XII.

Parallaxis Lunae horizontalis in quolibet [illegible] ejus a Terra aequalis est semidiametro [illegible] apparenti.

Nam quia proportionem quaerimus semidiametrorum [illegible] penumbrae, angulos etiam, quibus utraque [illegible] oportet. Atqui penumbrae et umbrae angulos [illegible] Luna, quippe a qua dilatatur penumbra [illegible] meter disci Terrae subtendere debet angulum [illegible] subtendit semidiameter Terrae angulum [illegible] zontalis.

Theorema XIII.

Lineae motus longitudinis [illegible] in planum disci Terrae projectae, [illegible] proportionem eam habentibus [illegible] ex Terra, quae est summa [illegible] ad parallaxin [illegible]

In schemate 2. [illegible] arcus [illegible], ducitur AE [illegible] Est [illegible] AI [illegible] laxis [illegible] ad parallaxin Lunae [illegible]

Problema [illegible]

Dividatur parallaxis [illegible] tudinis vel horarium [illegible]

Duobus circulis [illegible] recta [illegible]

[illegible] Si dixero, rectangulum sub segmentis diametri minoris [illegible] majoris factis, scil. BA, AC, aequari rectangulo sub segmentis [illegible] diametri majoris a linea VX sectionum facto, [illegible] majoris [illegible] et differentiae partium BA, AC vel summa vel differentia [illegible]. Nam rectangulum BA, AC est idem, quod quadratum [illegible] differentia segmentorum BA, AC est nihil. Nihil vero subtractum [illegible] AY, nihil additum ad AY facit AY.

Theorema XV.

[illegible] manentibus ut prius, si centrum minoris fuerit intra circumferentiam majoris, rectangulum sub partibus diametri minoris, quas [illegible] circumferentia major, aequale est rectangulo sub [illegible] diametri majoris minori, quod linea per sectiones [illegible] et sub differentia inter diametrum majorem differentiamque dictarum minoris partium.

[illegible] centrum minoris A intra circumferentiam majoris, et sit linea [illegible] secans ductam per E, A in puncto T, in qua EA continuata [illegible] circumferentiae majoris N, K, minoris L, M, [illegible] Et ipsi LK [illegible] aequalis versus A centrum [illegible] differentia partium LK, KM, et ON differentia ipsarum [illegible] EO. [illegible] sub LK, KM aequari rectangulo sub KI, ON. Ut hoc [illegible] demonstretur, considera, quod TF [illegible] puncto diametri T in utramque circumferentiam [illegible] aequale est rectangulo sub KI, [illegible] rectangulo sub LI, IM [illegible]. [illegible] rectangula haec utrobique sunt inter se aequalia. Verum quod sub [illegible] est eo, quod sub LK, IM quantitate ejus, quod sub KI, IM. [illegible] KI, IM. Quod ergo sub LK, IM aequale erit ei, quod [illegible], quod sub LK, IM [illegible] KI, KM [illegible] quantitate ejus, quod sub LK, KI [illegible] KI, ON; [illegible] aequalia [illegible]

NR, RK: sed quod sub SR, RH, minus est eo, quod [illegible] tate rectanguli quod sub NR, RH. Commune [illegible] Quod ergo sub SN, RH, aequale erit ei, quod [illegible] RK, RH, h. e. KH. Rursum autem, quod sub [illegible] quod sub SN, NH in propositione nominato, quantitate [illegible] quod sub NR, KH, majus est eo, quod sub NR, [illegible] nato, quantitate NR, ZH, h. e. SN ex constructione [illegible] quali aliquo majora sunt, quodque suo respondenti in [illegible] Igitur et nominata inter se sunt aequalia.[1]

Problema VIII.

Datis semidiametris luminaris et [illegible] arcus orae luminaris vel lucidae vel [illegible] partes diametri vel luminaris vel umbrae [illegible] per sectiones, quarum quae minor [illegible] naris vel umbrae dici [illegible]

Data enim diametro circuli et arcu [illegible] eadem dimensione, quae multiplicata in [illegible] stituit quadratum semissis de linea sectionum [illegible] a quadrato semidiametri umbrae, relinqui [illegible] gitaque ablatum est residuum neque ad [illegible] semidiametro umbrae ablata [illegible] semidiametro luminaris, et dimidio [illegible] [illegible] in eadem dimensione [illegible] [illegible] semidiametri, datum [illegible] metro constituit sagittam.

Problema [illegible]

Datis semidiametris [illegible] [illegible] de penumbra [illegible]

[illegible]

Problema XI.

[illegible] quantitate diametri tam luminaris quam umbrae, et [illegible] deficiente vel lucido, elicere quantitatem defectus.

[illegible] sagittas tam luminaris quam umbrae; et quantisper quidem [illegible] luminaris est in umbra, adde sagittae umbrae sagittam [illegible], pro quantitate defectus; at si obscurata ora fuerit major semi- [illegible] pro sagitta luminaris addendum est residuum diametri, semper [illegible] diametri, quae in umbra est. (Vel subtrahe sagittam umbrae a [illegible] luminaris pro residua parte luminosa.) Ita conflabitur summa scru- [illegible] deficientium.

[illegible] operationis per Logarithmos.

[illegible] lucida 81°

dimidius 40° 30′ logar. 43155′

[illegible] semidiameter ☽ 17′ 1″ — 120000 sexagenarius

logar. 169155 sexag.

[illegible] 11′ 8″, quod est dimidium lineae sectionum. Hinc sagittae per antilogarithmos.

[illegible] Semidiameter umbrae [illegible] 45′ 50″ Antil. [illegible]

[illegible] 17′ 1″ Antil. 1. 225 Semissis lineae sectionis 11′ 8″ Antil. 0. 515

0.1515 Ergo [illegible] 47′ 40″ [illegible] 465

0. [illegible] Sagitta umbrae [illegible]

[illegible]

Problema XII.

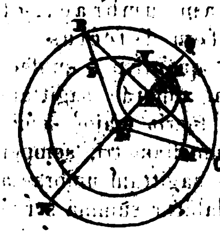
[illegible] defectus [illegible] quantitate [illegible] vel tenebrosae, et quantitate defectus, [illegible] semidiametrum umbrae Terrae.

[illegible] arcum magis quam [illegible]. Data enim semidiametro [illegible] totus ad sinum arcus lucidi [illegible] (schem. 3) [illegible] sic [illegible] semidiameter ad FI vel PB semissem lineae per [illegible] ad sagittam ejusdem arcus, sic semidiameter [illegible] in lineam per sectiones terminatur, [illegible] lineam quantitatem defectus [illegible] eadem mensura cum [illegible] KI [illegible]

[illegible] majoris, [illegible] et [illegible]

[illegible]

Fig. 4.



Scribatur enim circulus ... quem secet PF ... sit rectus, quadratum AB ... QA, AN. Sed QA ... est elementum utrique ... EQ vel LB constituta ... est aequalis compositae ... enim EO aequat AQ, AQ ... quae et EO cum AP ... igitur ad PN ipsa AP secunda ... EO et duas AP.

Problema ...

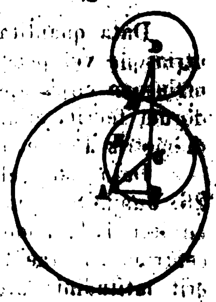
Data quantitate defectus et proportione ... ad axeum dimidiae durationis, ... semidiametri ... ad ...

Datur proportio OF et ... (schema ... AB arcum dimidiae durationis igitur ... AB, residuum transformetur in rectangulum ... bis, reliquum latus erit PA, cui addatur ... vel alterum latus aequet EO, reliquum ... dratum aequat rectangulum ex ...

Sit FO = 84′ ...

[illegible]posita ex DA, AC cum quadrato CB, aequare [illegible] BD.

Fig. 5.



[illegible] quia B rectus, CA^2, h. e. $AE^2 = AB^2 + BC^2$. [illegible] $= DE^2 + EA^2 + 2DE \cdot EA$; quare si [illegible] substituas $AB^2 + BC^2$, erit $AD^2 =$ [illegible] $+ 2DE \cdot EA + AB^2 + BC^2$. At vero [illegible] $+ 2DE \cdot EA = ED\,(DA + AE) = ED$ [illegible] AC). Ergo $AD^2 = ED\,(DA + AC) +$ [illegible] BC^2. Porro idem $AD^2 = AB^2 + BD^2$, [illegible] $D\,(DA + AC) + AB^2 + BC^2 = AB^2 + BD^2$. [illegible] aufer AB^2, relinquetur illic $ED\,(DA + AC)$ [illegible] hic BD^2, aequalia, q. e. d.

Problema XIV.

[illegible] diametro Lunae DE et arcu incidentiae CD, cum [illegible] morae CB in eclipsi totali, invenire semidiametrum umbrae AF et latitudinis arcum AB.

[illegible]: Addatur arcus incidentiae DC ad [illegible] arcus durationis dimidius DB, et super DB fiat quadratum, [illegible] quadratum super BC, residuum transformetur in rectangulum [illegible] diametri Lunae DE, [illegible] longitudo aequalis compositae ex [illegible] duplae ipsius AF semidiametri umbrae; deinde ablata [illegible] Lunae FE et super EA vel CA quadrato facto, [illegible] quadrato ipsius CB, residuum in formam quadrati [illegible] AB, arcum latitudinis.

[illegible] ☽ DE = 31′ 44″, arcus incidentiae DC = 30′ 30″, [illegible] CB = 39′ 46″. Ergo arcus DB durationis dimidius 1° 10′ 16″, [illegible] 1° 36′ 52″. Sed quadratum [illegible] dimidiae (CB) est [illegible] 22″ [illegible] 26. 22

1. 10. 30, Hoc divide per duplum diametri ☽ (DE)
1. 3. 29 [illegible] 30′ 39″ AF.

[illegible] ☽ 15′ 52″

[illegible] 22

[illegible]

Problema.*)

Data quantitate et loco unius eclipsis septentrionalis [illegible] utriusque vel pene totalis vel pene nullius, ut sit [illegible] utriusque circa apsidas oppositas, et siquidem [illegible] dorum fuerit, etiam nodorum locis datis, dato [illegible] diametris Lunae apparentibus, invenire semidiametrum [illegible]

Data sit eclipsis ☽ septentrionalis a. 1621, [illegible] 26. Junii, Sole in 4° 45′ ♋, quantitate 2′ 20″ [illegible] circiter 15°, nodo in 14° 57′ 30″ ♋, semidiametro [illegible] centrum umbrae abest a nodo per 10° 12′ 30″ [illegible] erit latitudinis arcus inter centra 56′ 31″. [illegible] ficietur summa semidiametrorum 58′ 51″. [illegible] ☽ 14′ 44″, relinquitur semidiameter umbrae uno loco [illegible] ☽: 44′ 7″.

Data sit altera eclipsis austr. a. 1621 [illegible] Sole in 29° 2′ 34″ ♐, quantitate digitorum 10 [illegible] 160° prope perigaeum, Lunae semidiametro [illegible] nodo existente in 5° 35′ ♐, qui cum [illegible] manente angulo priori, dat inter centra [illegible] 29′ 43″, conficitur summa semidiametrorum [illegible] semidiametro ☽ 16′ 43″, relinquitur [illegible] Adde hanc prius inventae 44′ 7″, [illegible] loco medio semidiametrum umbrae [illegible]

Quodsi nodus utrinque 11′, [illegible] utraque esset 1′ minor, sic et [illegible] igitur 2′ esset minor, et media [illegible] [illegible] peccati esset 2′ nimis, res per correct[illegible]

[illegible]

Datis iisdem ut in antecedenti [illegible]

Theorema.

[illegible] aliquot ⊙ eclipsibus cum tempore interlapso, [illegible] motus [illegible] ☽ crassiori Minerva.

[illegible] enim non in omni novilunio ☽ subtercurrat Soli, sed [illegible] evagetur, quoties ergo ☽ subtercurrit ⊙, necesse est, [illegible] esse [illegible] orbium Solis et sui.

[illegible] cum Solis orbis ab orbe Lunae secetur duobus locis inter se [illegible], si igitur ⊙ iisdem diebus anni incurreret in nodos, novilunia vicina [illegible] ecliptica, eodem coeli loco nodi persisterent, et sic Lunae eadem [illegible] esset in latum seu ab intersectionibus, quae est a fixis. Sin vero [illegible] annis sequentibus eclipses inciderent, argumentum esset, nodos [illegible] maturius, regredi. Ex quo progressu et regressu necesse est [illegible] elongationes Lunae a sectionibus ab iis quae sunt a fixis.

[illegible]: Anno 1605. 2/12. Oct. fuit magna Solis eclipsis et rursum [illegible] 14/24. Dec. Cum igitur a. 1601. eclipsis fuerit 14. Dec., anno vero [illegible] Oct., et anno 1608. 11. Julii, apparet igitur sectiones retro-[illegible]

[illegible] a 14. Dec. anni 1601 ad 2. Oct. anni 1605 numerentur men-[illegible] 47, dies vero desint orbitae Solis complendae 73, quibus re-[illegible] Solis gradus totidem, mensibus ergo 47, sive annis 4 [illegible] parte retrocedit sectio per 73°. Et igitur annis 19 retrocedit [illegible] circulum, et sit retrocessus nodorum in anno uno per 19°, [illegible] quam 3°. Itaque motus latitudinis Lunae seu elongatio a nodo [illegible] in die, quam a fixis.

Caput I.

[illegible]

tionem, ut ad usum rite adhibeatur, et omnes errores de [illegible] excludantur, postulet, Keplerus primus [illegible] stratione ob oculos posuit. Proxima igitur Solari [illegible] (quanta quidem praecisione fieri potuit), diametrorum [illegible] fuisse, quam proxime sicut 13 ad 14.

Locum posui integrum, ut axiomata, quae ex [illegible] oculis petuntur, pro demonstrationibus (quibus [illegible] rentur testimonio clari artificis, quae propria [illegible]

Cum igitur diameter Solis eo die fuerit [illegible] 14, sic 30′ 37″ fuisse ad diametrum Lunae [illegible] stola dicta usurpavi 32′ 59″, ex jam allegatis [illegible] bilis quidem consensus et certe suspectus aliquis [illegible] observatione Anglicana. Etsi quid opus esset [illegible] adulari suo olim discipulo? An fortassis ipse [illegible] 13 ad 14 inter se primorum proportio? quae [illegible] schemate Solari, quam menti ex calculo sese [illegible]

Sed et Jo. Ericksen audiamus. „Eclipsin [illegible] Solis initium propter loci incommoditatem [illegible] Confeceram mihi peculiare instrumentum [illegible] Kepleri, cum quadrante. (Opt. p. 340.) [illegible] diameter fenestrae illorum [illegible] [illegible] non fuerit serenum) in speculationibus [illegible]

Ea tibi Londini in Anglia diametrum [illegible] pavi 30′ 37″, Lunae vero diametrum [illegible] Maestlinus Tubingae in Suevia, observavit [illegible] hac collatione diversissimorum locorum [illegible] servandi et de quantitate hujus [illegible] enim consensus peti ab oculis non [illegible]

Cum autem [illegible] verum [illegible] at igitur hic [illegible]

Caput II.

De motu Lunae horario in syzygiis.

[illegible] horarius Lunae ex observationibus fide dignis haberi possit, jure [illegible] principia resumitur.

Sequitur quidem ex hypothesibus artificum aliquis certus horarius in [illegible] anomaliae Lunae partibus. At causae sunt, cur iis solis hac in [illegible] non utendum, neque testimonia observationum de iis negligenda [illegible]. Nam cupio hanc materiam, quoad fieri potest, per se stare, [illegible] comprehensa facilior et fide dignior. Latuit enim veteres aliquid [illegible] Lunae, in conjunctionibus et oppositionibus; quod posterior [illegible] diligentia in lucem extulit. Satisfaciendum itaque sollicitudini geo[illegible] ingeniorum, quae propter hanc leviusculam differentiam caven[illegible] putabant ab horariis, qui nobis ex auctorum hypothesibus of[illegible]

[illegible] (Epit. Astron. p. 444) ex hypothesibus Ptolemaicis prodit, in una [illegible] Solem a Luna apogaea 27′ 52″, medioeri 30′ 29″, perigaea 38′ 35″ [illegible] in Prut. Tab.

[illegible] ex Copernico sic:	26. 33	—	30. 9	—	35. 7
[illegible] Braheus in Tab. Lu- [illegible] p. 128):	27. 12	—	30. 42	—	[illegible]. 37.

[illegible] necesse est, Ptolemaeum et Copernicum in quantitate convenire, [illegible] hypothesibus utantur circa hanc rem aequipollentibus. Etenim quod [illegible] praestat epicyclium, retrahens Lunam apogaeam sub Sole trans- [illegible] antecedentia, et perigaeam promovens in consequentia, plus quam [illegible] majoris epicycli; idem Ptolemaeo praestat apogaeum epicycli [illegible] semper vicinus lineae per Solem et Terram ductae, quam apo- [illegible] epicycli verum vel punctum concavitatis, et perigaeum e [illegible]. Itaque horarii Maestlini nituntur [illegible] [illegible]. Eandem rationem et Braheus in [illegible] diurno [illegible]

[illegible]

centra Solis et Lunae inclinatio ad circulum [illegible] modo habeantur modo observationis admirabili, [illegible] vide problemata praecedentia ejus libri. [illegible] inter opticam et astronomiam, ut nescias, ad [illegible] referas. Itaque passim in illo libro nuncupavi [illegible] partem secundam illius, interdum appendicem: [illegible] ambulum dici debeat.

His quatuor rebus uno et eodem [illegible] probl. 24. longitudo et latitudo visibilis [illegible] fiat duobus momentis a se mutuo distantibus [illegible] probl. 26. superexstruit veram utroque momento [illegible] proinde et verum motum Lunae a Sole, [illegible] quem horarium dicimus, si quantum da [illegible] stituatur.

Assumit tamen problema illud 26. hanc [illegible] sit praecognitus parallaxeos Lunaris excessus super [illegible] si quid falsum admittitur, non penitus [illegible] vel 3′ in parallaxi falsitas utrinque eadem [illegible] si 1′ vitietur motus duarum horarum, quod [illegible] bationem manuum et instrumenti, quando [illegible] aut quantitas eclipsis, dimidio jam minute [illegible] tum in Braheanae hypotheseos horarie vix [illegible]

Utamur nos tamen exemplis, non [illegible] demonstrationem, sed ut [illegible]

Anno 1601. d. 14/24. Dec. [illegible]

[illegible] Lunae 17′ 42″. [1]) Eodem modo etiam alio momento, [illegible] hora [illegible] observati sunt digiti 6⅓, inclinatio centrorum 14° a verticali ad [illegible]. Distantia igitur centrorum per probl. 12. est 10′ 28″. Tum [illegible] 6° 51 [illegible] et secat verticalis eclipticam angulo 60° 30′. Itaque [illegible] angulo 46° 30′, dans ex columnis 10′ et 28″ latitudinem [illegible] 36″, ejusque complementum 43° 30′ dat longitudinem Lunae [illegible] 7′ 26″. Et quia cum 18° 3′ [illegible] versatur in nonagesimo [illegible] distans a vertice 60° 3′, erit per usurpationem prioris [illegible] quasi verae latitudinis parallaxis 48′ 32″, cui addita visa latitudo [illegible] quippe borealis, facit Lunae veram latitudinem hoc momento 56′ 8″; [illegible] vero 29° 57′ distantiae nonagesimi a vertice dat longitudinis [illegible] parallaxin 27′ 57″. Sed quia Sol abest a nonagesimo per [illegible] ergo sub columnis 27′, 57″, respondet longitudinis parallaxis 27′ 27″ [illegible] cui adde visam Lunae superationem 7′ 26″, prodit quasi vera [illegible] 34′ 53″. Atque hoc est alterum momentum.

[illegible] horarium hinc eliciemus, comparato momento utroque. Ablata [illegible] ex motu Lunae a Sole parallaxi, relinquitur igitur verus motus [illegible] Sole.

[illegible] 17′ 30″ Luna praecessit 17′ 42″
[illegible] 9. 30 secuta est per 34. 53, ergo horis
[illegible] 52 promota est a Sole per 52′ 35″. Itaque horae uni competerent [illegible] in apogaeo fuit. Brahaeus, ut supra dictum, Lunae in apogaeo [illegible]

[illegible] vitium nihil peccari potuit in longitudine. Nam in prin[illegible] [illegible], in posteriori momento celeriter quidem mutabatur [illegible] distantia centrorum fuit parva, ut unius gradus aberratio [illegible] potuerit non ultra 8″. Diametri luminum etiam [illegible] aestimatio defectus. Ego enim hic ita operatus sum, [illegible] deficiebat in principio. At si nihil defecisset, ego non [illegible] initium defectus. Quod si in principio, [illegible] Solis [illegible] minuto [illegible]

[illegible]

inclinatio 72½°, culminabat 27° ♉, [illegible]
Ergo angulus eclipticae et circuli per centra [illegible]
meter 30′ 2″. Lunae vero anomalia [illegible]
meter 32′ 20″, summa igitur semidiametrorum [illegible]
angulo dicto ostendit visam latitudinem Lunae a [illegible]
Hora 2. 42′ inclin. 64° 15′, quantitas defectus [illegible]
minor 4 digitis. Itaque distantia centrorum [illegible]
Angulus verticalis et eclipticae 55° 7′, [illegible]
lus inter centrorum circulum et eclipticam [illegible]
17′ 40″, longitudo visibilis Lunae a Sole 1 [illegible]
ad visum per 47′ 38″ in longitudinem, [illegible]

Parallaxin assumam 59′, ut Luna tribu[illegible]
humilior, quam in priori exemplo. In primo [illegible]
gesimo 21½° ♉, cujus a vertice distantia [illegible]
dinis 25′ 34″. In secundo momento fuit [illegible]
vertice per 32° 26′, itaque latitudinis parallaxis [illegible]
prior per 6′ 5″. Latitudo igitur vera [illegible]
visa, sc. per 6′ 1″ tantum.

Eodem modo per complementa [illegible]
64° 20′, 57° 34′ [illegible] longitudinis [illegible]
49′ 53″. De quibus per distantias Solis [illegible]
ostenduntur parallaxes long. 3′ 7″ [illegible]
jecta promotioni longitudinis a Sole visibilis [illegible]
promotionem veram Lunae a Sole, [illegible]
h. 2. 42′, [illegible] sc. 2. 4′. [illegible]
exhibet hypothesis Brahei 31′ [illegible]

Sic in eclipsi Solis, quae fuit [illegible]
et [illegible] parallaxi Lunae a Sole [illegible]
a Sole nihil [illegible]
Vide [illegible]

In eclipsi Solis anni 1598 [illegible]
[illegible]

[illegible] 55′ digressionis a Sole) respondere putatur augmentum lati[illegible] 5′ 13″, parallaxis igitur talis est eligenda, quae lati[illegible] longitudini ad hunc modulum correspondentem. Quo [illegible] et de longitudine, i. e. horario, et de parallaxi. Quam ad [illegible] exemplis supra positis tractavi parallaxes latitudinis, et in primo [illegible] longitudinis arcui 52′ 35″ latitudinis incrementum competiit [illegible] parallaxi 56′. At cum parallaxi 50′, digressioni Lunae a Sole 51′, [illegible] variatio 6′ 9″, illa igitur parallaxis verior est, quam haec. In [illegible] vero exemplo motu a Sole per 1° 6′ 38″ Luna deprehenditur lati[illegible] 6′ 1″, itaque parallaxis 59′ ibi adhibita non multum [illegible] a vero; et sic et horarius utrinque confirmatur.

[illegible] plus delectant haec problemata artificio, quam prosunt subtili[illegible]. Observationes enim nonnisi limatissimae requiruntur, [illegible] unquam haberi possunt.

[illegible] praeterea supponitur cognitus latitudinis angulus, de quo nihil adhuc [illegible]. Et quia multo magis prodest hic modus arguendae parallaxi cras[illegible] quam horario, pertinet igitur ad sequentia.

[illegible] igitur his duobus modis horarios observandi, transeamus ad alios, [illegible] non tantum nihil indemonstratum praesupponitur, sed etiam magni[illegible] qua ratiocinamur, pleniorem fidem facit circa id quod [illegible] concludimus.

[illegible] Lunae oppositae Soli ad unguem aequales esse motibus ejusdem [illegible] Soli [illegible] paribus, tritissimum est apud astronomos. Si ergo [illegible] in oppositionibus, ii valebunt et in conjunctionibus. Si [illegible] negare voluerit astronomis, quod quidem ex omnium [illegible] sequitur, convinci is poterit consensu horariorum, quos [illegible] investigavimus, cum iis, qui jam pro[illegible]libus. Horarius vero oppositionum habetur facile, si, [illegible] oppositionem [illegible] naturali, ex[illegible]

[illegible] obtineret citra mixtu[illegible] ut exploraret, quando Luna esset [illegible] a puncto eclipticae [illegible] paral[illegible] nihil in longum. [illegible] facto duobus continuis die[illegible] facile patuit [illegible] motus verus.

[illegible] Oct. [illegible] fuit oppositio Lunae et Solis, Luna in apo[illegible] praecedenti vespera [illegible] 24′ circa nonagesimum ab [illegible] inventa est in 1[illegible] 47′ ♈, cum latitudine [illegible]. Sequente vespera [illegible] h. 11. 22′, oriente [illegible] nonagesimo. Cum [illegible] parallaxis [illegible]

[illegible]

diametri Lunae unum fortasse aut alterum [illegible]
Nam solet capi distantia marginis Lunae [illegible]
clarioris et integri: postea aestimatione [illegible]
stantia Lunae a fixa. Ubi si diameter Lunae [illegible]
quo in Opt. Cap. V. fol. 266—268), tunc [illegible]
diversum utrinque introrsum plus justo truditur, [illegible]
brevis efficitur. Parum tamen hoc potest, in [illegible]
diurni vicesima quarta demum parte attinet [illegible]
modus usque ad sextantem scrupuli. [illegible]

Sed transeamus etiam ad observationem Lunae [illegible]
gaeo. Anno eodem 1595. 24. Febr. paulo ante [illegible]
et Lunae perigaeae. Praecedente igitur hora [illegible]
oriente 29° ♏ distabat occidentalis Lunae [illegible]
41° 35′.

Declinatio superioris limbi 15° 84′ 0″, [illegible]
inferioris 44. 58. 40 [illegible]
diameter 35. 20 [illegible]
semidiameter 17. 40 [illegible]

Lunae distabat a capite inferiore ♊ 41° 53′, [illegible]

Hinc computatur locus Lunae sic:

Anno 1600. completo [illegible]
Annis 6 solidis completis (subtr.) [illegible]

[illegible]

Complem. declin. [illegible] 61° 4′ 17″ [illegible]
declin. Lunae 15. 26. [illegible]
76° 30′ 17″ [illegible]
[illegible]

[illegible]

[illegible] post meridiem h. 2. 56′, oriente 14½° [illegible] [illegible] remotus

32° 26′ 20″
Adde semid. 16. 40
Centri remotio 32. 43.
37. 17. — 54155
2272
86407 : 97722 = 88421

[illegible] 22 — 99094
[illegible] 95460.
4544
2272
97722
22° 59′ 30″
42430
3664
254580000
13729000
24165
24400 — 1. 22. 4

62. 9. 20
27. 50. 40
Fixae A. B. 195. 59.
168. 8. 20
168. 2. 54 — 17° 5′ 51″ ♍ — 5. 8. 5
5. 26.

2. 33
Declin. 5. 6. 29
Lun. 8. 22.
Basis lat. 3. 15. 31.

17. 5. 51 ♍
15° 42′ 47″ ♍ locus ☾ in ecliptica.

[illegible] 338
[illegible] 210
[illegible] 14

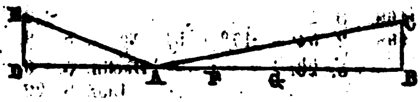
[illegible] 24° [illegible] 0.
[illegible] 30 [illegible]
[illegible] 322 ♑ [illegible]
[illegible] 15. 42. 47 [illegible]
[illegible] 16. 12. 31
[illegible] 15. 2. [illegible]

[illegible] 18. [illegible] 48 [illegible]
12. 48. — 30
2. 35. 48
2. 32. [illegible] Minus

[illegible] in perigaeo prodit [illegible] quia [illegible]; [illegible] hypothesis [illegible]. Hac posita, ex quantitate temporis [illegible] in [illegible]

sit, ob aliud et aliud Lunae et Telluris [illegible]
Duo vero sunt argumentorum genera. Solari[illegible]
riante ratiocinamur, opticum utramque [illegible]
tabilis deprehenditur mutari, aut motus.
et materia, ut a corpore incipiamus.

Fig. 6.



16′ 40″; quaeritur proportio linearum [illegible]
anguli ad B, D sint recti, et noti qui ad A [illegible]
anguli residui ad rectum. C quidem [illegible]
Ut igitur sinus totus ad angulorum [illegible]
lineas DA, BA. Si enim BC vel D[illegible]
DA vero 206[illegible]. Quibus in [illegible]
Bisecta vero BD in puncto F, erit BF [illegible]
Igitur FA eccentricitas 960000 [illegible]
habebit 4444. Tanto longius [illegible]
cum mediocriter. Sed quia plurim[illegible]
sensu [illegible] plurium argu[illegible]
enim [illegible], quid ad illa, [illegible]
Ex motus igitur [illegible]
tervallo mutabili: aut enim to[illegible]
inferiorem, aut diurnos motus locorum [illegible]
igitur de totis [illegible]

[illegible]

autem [illegible]
verum 175471, ut igitur hic [illegible]

[illegible], recenti quantitate aequationis hujus, nihil [illegible] in ec[illegible] [illegible] potuit.

[illegible] aliquid demsit. Nam ejus aequatio [illegible] [illegible] syzygiis 4° 56′ 20″ ostendit eccentricitatem 8610. Atque hic [illegible] investigandae eccentricitatis Lunae idem apud omnes.

[illegible] non unum est, quod in hac ratione desiderem. Primum enim [illegible] principio insufficienti. Non enim omnis variati motus inaequa[illegible] fallacia visus oritur: aliquid ipsi etiam Lunae, non minus quam [illegible] vera inest planetis. Quemadmodum enim illorum motus et [illegible] vere, cum a Sole digrediuntur et contrahi in angustum videntur, [illegible] a visu, idque aequalibus prepemodum utrisque decrementis, [illegible] evenit, ut sinus aequationis maximae non totus, sed parte sui dimi[illegible] eccentricitatem, qua de re vide praeludium loco supra allegato [illegible] plenissimam vero demonstrationem Commentariis de Marte, [illegible] eundem modum et in Luna res habet, ut semicirculus, qui a Tellure [illegible], non tantum minor visui videatur ob remotionem majorem [illegible] etiam lentius et longiori tempore a sidere decurratur. Quae [illegible] compositae cum conficiant aequationem maximam copularem, [illegible], 5°, quaelibet igitur per se canstituit dimidiam $2^1/_2$° [illegible] eccentricitati orbis Lunae (epicyclum enim veterum auctorum [illegible] commuto, ut similium rerum similes etiam sint con[illegible] non plus quam 4365, dimidium sc. de Ptolemaica: quod [illegible]

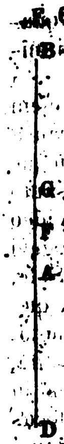
[illegible]

motu Martis. Verum origine et methodo [illegible]
quibus mea eccentricitas est exstructa, spero [illegible]
iri Braheana quam Ptolemaica veteri. At [illegible]
tus: restat, quod non tantum in veteribus sed [illegible]
ut supra paulo profiteri coeperam. Magnum [illegible]
bisectionem eccentricitatis Ptolemaicae cum variatio[illegible]
das, acquiescendum in hac eccentricitate 4360, [illegible]
ingruant objectiones aliae. At primo imbecillis [illegible]
metri Lunae apogaeae in speculatione adeo subtili [illegible]
ipsa solitudine: optandumque (si impossibili[illegible]
hujusmodi existerent, atque ita inter [illegible]
posset, quod est medium. Quid enim, si [illegible]
in aestimando, sed longe ante manus in [illegible]
fenestella et lunula papyracea, quam facile [illegible]
minuti? Quod nolim eo trahi, quasi de [illegible]
rebus enim minutis, ubi semisses et quadr[illegible]
unciis jam difficultas potest incipere. [illegible]
hac subtilitate tuenda timidiusculae. [illegible]
magna verisimilitudine pugnans, qui [illegible]
habet. Veteres inaequalitatem motus Lunae [illegible]
bar Lunae. Umbra enim Telluris [illegible]
verissimum Lunae locum in Solis opposit[illegible]
ratione inaequalitatis Lunae in [illegible]
penderet obscurata in quadrantis [illegible]
quadrantaria longe aliam, majorem [illegible]
pro quo Braheus correxit [illegible]

[illegible]

[illegible] quia aliis diebus copulantur luminaria. At Luna ex qua[illegible] aequalis versante, ponunt istam eccentricitatem reddi mi[illegible], quanta requiritur ab observationibus copularum. [illegible] ego causas motuum ex physica accerso, videor aliam rationem [illegible]. Si enim eccentricitas hoc nomine fit aequationis causa [illegible] semicirculus superior a fonte virtutis distat longius, eamque [illegible] fortem experitur, ut alter humilior: certe, Sole versante [illegible] apogaeum (quod veteres dicunt epicycli, ego eccentri), Luna ideo [illegible] magnam aequationem in quadris, quia non tantum locus apogaei [illegible] a Terra distat, sed ipsa etiam Luna ante octiduum cum Sole, [illegible] loci apogaei fuerat, multum tunc a Terris re vera remota, ex quo [illegible] dies octo in languidiore virtute usque ad quadram promota, [illegible] accumulavit differentiam motus seu aequationem. Vicissim, [illegible] apogaeum et perigaeum Lunae medio loco versante, Luna in [illegible] ideo minorem habet aequationem, quia non tantum locus [illegible] brevius a Terra distat, sed ipsa etiam Luna ante octiduum [illegible] est in apogaeo illo fuerat, minus a Terris remota, quam [illegible] apogaeum cum Sole. Hoc itaque pacto plane contra[illegible], quod putabant artifices priores, ut angustiora sint inter[illegible] humillimae et altissimae in quadris quam in copulis, cum illi [illegible] neque sit eccentricitas orbis Lunae, non ut apud veteres [illegible], sed rarius, nimirum quoties Sol in lineam apsidum Lunae [illegible] fit bis paulo minus. Nisi forte causam quis dicat [illegible] aequationum differentiae, cujusmodi ego quidem in[illegible]

[illegible] posito, quod aequatio 7° 28′ [illegible] 8500 [illegible] linea apsidum Lunae [illegible] 100000 [illegible]



In schemate superiore (Nr. 6) sit A [illegible]
Lunae, D perigaeum, F centrum orbis, G [illegible]
aequales, per ea quae demonstrata [illegible]
Primum subtrahamus variationem [illegible]
a Sole competit acceleratio seu variatio [illegible]
habet tantum 27′ 3″, perigaei 35′ 42″ [illegible]
modulum erit illic 39″, hic 51″. Et [illegible]
aequalia ponitur in apogaeo et perigaeo [illegible]
inaequalem esse, id igitur in fine [illegible]
= 26′ 24″ = 1584″; 35′ 42″ [illegible]
Medium proportionale = 1820; [illegible]
= 1955½, differentia AE = 135½ [illegible]
tunc ex FA fiet 6930, quod [illegible]
citatem 6500. Causa cur [illegible]
potest. Sit enim mediocris [illegible]
et 51, tunc 6500 eccentricitas [illegible]
quia priori modo mediocriter fuit [illegible]
Itaque pro 29 et 51 debuimus usurpare [illegible]
horariis relinquitur 26′ 26¼″ et 34′ 42¾″ [illegible]
autem medium proportionale 1820; [illegible]
FA = 133⅛. Sin autem ex [illegible]
circiter, quod propius ad [illegible]
Lubet vero, et in Tychonis [illegible]
ex observationibus desumitur [illegible]
In apogaeo 27′ 12″ = 1632, 1632 [illegible]
35′ 27″ = 2127; 2127 [illegible]
tionale est 1863 [illegible]
6649, quod proximum est priori [illegible]
[illegible]

[illegible] horariorum tractatio in copulis de majori eccentricitate, [illegible] 6320 testari videbatur, toties animi dubius, horariis assum[illegible] abjeci totum negotium desperato explicatu. At non me [illegible] physica contemplatio, fidissimus mihi comes per totam [illegible] [illegible]issimus. Ex ea enim tandem patuit, non opus esse, ut [illegible] mutatio eccentricitatis, sufficere, ut sit annua: imo ne stare [illegible] rationes physicas, nisi sit annua. Etenim in opere de Marte de[illegible] est, eccentricitatem circuitus planetae existere a vi magnetica [illegible], quae lineis rectis toto corpore globi porrigitur constanter [illegible] in longitudines medias. Fit itaque raptu globi circa Solem, ut [illegible] opposita puncta Soli obvertantur, quae ut opposita oppositam [illegible] obtinent. Nam illo extremo, quod in longitudinem mediam prio[illegible] globum suum fugere a Sole per ascendentem semicircu[illegible] [illegible] jugo altera extremitas in posteriorem longitudinem [illegible] per descendentem semicirculum prolectare incipiat globum [illegible] ad Solem adnaviget. Ascendere enim est, inter gyratio[illegible] sibi illatam fugere a Sole: descendere est, raptui circulari [illegible] sibi illato miscere accessum suum ad Solem intrinsecus ortum. [illegible] Comment. huc transferenda fuerunt: jam ad Lunam ac[illegible]

[illegible] circa Terram a Terrae gyratione menstruo circumactu gy[illegible] cum ceteris planetis affectiones sui corporis obtinet, sed qui[illegible] longinquum, sed vicinam Tellurem, a qua gyratur, vicissim [illegible] quae etiam efficiunt, ut quamvis Tellus a Sole per aetherem [illegible] Luna illam comitatur semper in justa distantia. Haec [illegible] corporis Lunaris, quomodo causatur eccentricitatem [illegible] Tellaris [illegible] mediocriter patet in exemplo plane[illegible] qui a centro Solis sunt eccentrici. At quomodo [illegible]

[illegible]

eique puncti modo objicitur, ac si qu[illegible]
obtineret: quod fit, si Sol medias Lunae [illegible]
mensura punctum hoc enascitur in lineam [illegible]
centricitatem et aequationes. Sed in sinuum [illegible]
hoc in proportione sinuum distantiae Solis a [illegible]
necesse est.

Transegisse mihi videbar hisce sic cons[illegible]
intellexi, nondum quippe transactum erat in [illegible]
extremas apogaei Lunae habitudines ad [illegible]
hanc inaequalitatem Lunae ab apogaeo [illegible]
modo unam et eandem virtutem magn[illegible]
eam postea intendere aut remittere, [illegible]
vationibus testantibus, ut a linea per [illegible]
incipiat. Fieri enim potest per alios sit [illegible]
aequatio secunda Luna extra apogaeum [illegible]
et vicissim accidit, ut Luna in apogaeo [illegible]
aliquam aequationem secundam: quod e [illegible]
unam, sed duas in Luna esse virtutes [illegible]
stans, posterior cum discessu apogaei [illegible]
deficiat, et cum quadrante dis[illegible]
autem haec secunda vi[illegible]
Lunam sequi Terram alterna [illegible]
quelae vel fugae in quad[illegible]
in Terram porrigat. At [illegible]
porrigitur, ut supra dict[illegible]
et Terrae coincidunt in [illegible]
[illegible] in eandem [illegible]
Ergo [illegible]

[illegible]

[illegible] virtutibus, is igitur statuat intra exteriorem Lunaris globi crustam [illegible] abditam sphaeram aliam convertibilem intus, quae polos et axem [illegible] suae habeat in linea per Solem et Terram, quod potest fieri per [illegible] poli in Solem, convertaturque sic, ut quoties Sol ab [illegible] Lunae venit in perigaeum ejusdem, toties illius partes dextimae [illegible] sinistimae: et tunc positione magis physica plane idem obtinebitur.

AD MOTUM LUNAE RESTITUTIONES PERTINENTIA.

[illegible] his gradum sistit Keplerus et hinc inde plane interruptus est ordo et series disquisitionum Lunarium. Quae alia insunt codicibus Petropolitanis, documento quidem sunt, Keplerum ad finem perducere studio nunquam intermisso statuisse, neque vero ex his fragmentis [illegible] deduci potest et compilari Lunae theoria, nisi quis conetur plane novum [illegible] opus, cujus nullum videmus usum neque astronomiae neque historiae hujus scientiae. [illegible] inter manuscripta eorum, quae „Hipparchus" Kepleri comprehensurus erat, exstat [illegible] volumine XV. Mss. Petrop., quod totum eclipsium calculis refertum est, eclipsium [illegible] a. 1572. ad a. 1625) accurata inquisitio, quam forte Keplerus adjungendam [illegible]. Conscripta certe sunt haec folia Kepleri manu ad typum praeparata, [illegible] „de libro" perfecto, admonetque „lectorem" quasi praesentem. Ratione [illegible] eadem, quam supra (p. 540) proponit, eamque in omnibus his 46 eclipsibus [illegible] calculo comparat.

[illegible] autem haec habet: Possent fieri distincta capita utpote: 1) De [illegible] luminarium observandis, indeque et de eccentricitate Lunae in [illegible] et oppositionibus.

[illegible] De motu diurno et horario Lunae in conjunctionibus et oppositionibus [illegible].

[illegible] nodi et angulo latitudinis, h. e. de latitudine maxima, una cum [illegible] observanda. Et admonitio super inconstantia hujus anguli [illegible] de observatione hujus ipsius anguli, citra maximae latitudinis [illegible] duplici, vel ex eclipsibus simpliciter, vel cum paral- [illegible] perihelium [illegible]. [illegible] Semidiametri umbrae variae. 6) Lunae parallaxes [illegible].

[illegible]

AD MOTUUM LUNAE RESTITUTIO[illegible]

DOCUMENTA PRAE[illegible]

OBSERVATARUM ET PARTIM EXAMI[illegible]

Pleraeque eclipses Lincii rursum de novo [illegible] etiam sequentium annorum eclipses [illegible]

I. Eclipsis Lunae, quae visa est [illegible]

Historia observationis. Cum Gemma [illegible] diem 24. annotat ventorum tempestatem magnam [illegible]

Lauterbachius Graecii Styriae in Ephemeride [illegible] scripsit magnam tempestatem, ad 26. pluviam, [illegible] utique quia etiam in ipsius loco coelum [illegible] junguntur illis diebus in [illegible] [illegible]

[illegible]

[illegible] apparet tempora Lauterbachii, qui medium cum Eph. [illegible] [illegible] 10. [illegible] non ex observatione, sed ex nuda accommodatione ejus, quod [illegible] ad merid. Graetiensem.

[illegible] si quod Uraniburgi computatur apparuisset, in h. 9, 57' [illegible] [illegible] 25'. Quare nihil est opus etiam durationem addere, ut quae [illegible] Scrupula quidem dimidiae durationis essent 39' 30", [illegible] Prog. fol. 128 quippe ultra ☊ extensus, esset 32' 56", [illegible] dimidia duratio h. 1. 16' 43", tota 2h 21' 26", cum Lauterb. habeat 2. 50. [illegible] subjungo etiam meum calculum, de cujus tamen epocha nostri temporis [illegible]

[illegible] ☉ Anno 1572. 16. Jun. h. 15. 23' ☉ in 5. 13. 59 ♋
25. „ „ 9. 46 7. 36. 50
8. dies h. 17. 23 41. 20
57. 5 13. 32 ♋
4983
32294
37277

[illegible] ☽
[illegible] 27. 0. 25. 7 — — 4. 6. 30. 55 — — 4. 3. 48. 6
31. 46
[illegible] 0. 36. 0 1. 46
25. Corr.
203. 10. 27. 7
192. 21. 10. 4 0. 21. 29. 22 4. 3. 39. 34
[illegible] 13. 17. 3 4. 15. 24. 2 10. 12. 50
35. [illegible] 10. 4 ☊ 23. 26. 44 ♋
[illegible] ☽ 13. 34. 26 ♑ ☉ 13. 32 ♋
[illegible] Requisitus 13. 34. 29 9. 54. 44 lat. 0. 54. 51
[illegible] 2. 28 Reductio

[illegible] Ipsissima oppositio 13. 34. 28 ♑ [illegible]
[illegible] Aequatio [illegible] 20" [illegible]
[illegible] Ergo h. 8. 20' 30" [illegible]

[illegible]

[illegible] 5. 220 [illegible]

Duratio h. 2. [illegible]

Sequitur calculus hujus [illegible]

Huic aequatio est 1'. 5 [illegible] Ergo tempus medium [illegible]

[illegible]

habet „in Museo nostro Herivadiensi a. 1572 ... criptio eclipsis futurae, cum praescriptione altitudinum ... cipua momenta seu phases, idque in horizonte ... 10° ae minor ea, quam Reinholdus assignat ... lum longo post tempore inter epistolas Jo. Pratensis ... dendum dedit, initio facto ad Epistolarum Vol. II ... ultra 12 paginas continuavit. Sed accessit tamen ... auctoris, in qua refert, eclipsin hanc a se fuisse observatam ... sdorpiana. Initium paulo prius quam caput ... totam exstinctam fuisse in alt. ejusdem 22° 40′. Cum ... elatam ad 17° 50′, finem non conspectum ob nubes ... totam plenam fuisse, cum supremus margo alt. ... ita prodit, nec attento quod paulo alias praedixisset ...

Computabimus igitur tria dicta momenta.

	34. 0	log. 58126	34. 0 — log. ...
Inf. ♊	61. 2	„ 13364	Canis ... 45 — „ ...
	27. 2	71490	49. 45
Dist. a ♈.	75. 30		27. 2 ... 71490
	102. 32 — 51. 16 — 21838		67. 20
	48. 28 — 24. 14 — 89049		94. 22. — 47. 11 — ...
		113887	40. 18. — 20. 9 — 10...
		42397	187...
	108. 0 — 54. 0 — 21199		91. 54 — 45. 57 ...
A. R.	109. 49		109. 49
A. R. M. C.	1. 49		17. 55
			1. 49
			16. 6

Hine prodit tempus ... paulo antequam ... A. R. M. C. 30° 1′. Et quia ☉ ... 78 ... A. R. 286. 37, hinc tempus ... autem ponitur esse 2′ ... Hafnia ... Progymn. fol. 92 ... h. 8. 21 ... In chartis ...

Frid. ... ex obs. ... esset 15. ... 1h 53′ ...

...

Hinc ... dicam ...

Igitur calculus Tychonis medium observatum praevertit, statuitque medium h. 8. 1′ 40″ [illegible]. In cujus favorem assumtum fuit medium h. 8. 2′ aequali. De hoc sane multum [illegible], quia dum agnoscitur phasis, illa jam transiit, [illegible] dum [illegible], [illegible] alia aliqua pars coeli: quin etiam errorculus in [illegible] facile [illegible] surripit vel obtrudit.

[illegible] umbrae est 45′ 48″, variatio umbrae 56″, umbrae igitur semid. correcta [illegible] 17′ 28″ Summa.

[illegible] — 15. 440 Scrupula durationis dimidiae 61. 27
[illegible] — 30. 470 59532 — 33. 5
15. 970 74910 — 28. 22

Duratio dim.	h. 1. 51. 27	15378
Dif. semid. 27. 24		78380
Dimidia mora	49. 42	18848

Tempus incidentiae h. 1. 1. 45. Haec satis bene cum observatis stant: etsi umbra non sit geometricae quantitatis assumta.

Ex meo calculo sic computo:

Aequatio temporis physica est hoc ☉ loco 1′ add., astronomica esset 2 subt. Nam [illegible], de quibus corrigendis hoc libro deliberatur, usurpo sic, ut aequatio temporis mihi [illegible] seu a 2° ♋ incipiat, ubi Tycho habet 0. 45″. Contra ubi ille nihil habet, ego [illegible] physica 12′ 20″ vel addo astron. 8′ 12″, prout eclipsium suffragia huc vel illuc [illegible] inclinaverint.

[illegible] ergo tempus medii est h. 8. 12′ 40″

[illegible] 7. 6. 20. 55 — 5. 19. 29. 30 — — 8. 13. 22. 25
[illegible] 334.
[illegible] 7. 8. 12. 40
[illegible] 14. [illegible]. 38
[illegible] 1. [illegible] — 1. 6. 54. 38 — 0. 18. 56. 8
9. [illegible] — 6. 29. 25 [illegible] — [illegible]
[illegible] 4. 2. 3. 44 28. [illegible]
13. [illegible]
1. [illegible] 25. [illegible]
[illegible] 14 ♌ 25. 26. 49 ♊
☉ 15. 32 4. 2. 19. 45 ☉ 20. [illegible]
[illegible] ☽ 27. 3. 21 1. 30. 25 Lat. [illegible] Simplex Tychonica quasi [illegible] 58″ correcta
[illegible] 28. 50. 49 [illegible]
[illegible] — 17. [illegible] 53. 32 — 13[illegible] 26. [illegible]
[illegible] 55. 47 h. 6. [illegible] 7. 12.
[illegible] 17. 330 [illegible]

[illegible] 18. 30 — 37140
[illegible] 36. 46 — 19[illegible] — 56212
[illegible] 67. 24 — 3950

[illegible] ei Calculationem [illegible] hujus eclipsis [illegible] Tychonicam cal- [illegible]

[illegible]

Tychonicam umbrae non esse geometricam, sed ... non semper eodem modo se habent. Hic enim ... calculo Tychonis, at alias discedunt longius. ... exemplo. Tycho parall. ☽ infra long. mediam ... adde parall. ☉ 3′ 7″, acervantur 66. 7. Hinc ... exhibet 16′, restat semid. umbrae 50′ 7″, si umbra ... gatur. At Tycho jubet hic umbrae semid. statuere ... fit 10′ angustior, quare ad 18″ temporis decedent durationi, ... ipse compensat aliter. Atque hoc est illud, quod Origanus ... alii publicis scriptis in Tychone desiderant. Ne mireris ... tenebris fieri 12′ prolixiorem observata; verissime enim ... Braheus de ☽ corpore dixit (Prog. p. 134), vi luminis ... quomodo fiat, disputo in Opticis, et in Epitome ...

Confirmat hoc πάθος umbrae etiam duratio temporis ... ego prodam 58′, Tycho 62, observatio dat plus quam ... runt limites illi umbrae dilutae, quorum ingressu Luna ... mae margo incipit obfuscari, quam illi limites, quibus ... desinit in lumine censeri: quidquid est inter ... in principio eclipsis pro tenebris habetur, ... corpore, in fine vero incidentiae id habetur pro lumine ... in toto reliquo corpore. Atque hinc est, quod ... est mihi dimidia mora quam observatum, quanto ... ut sic dimidiae durationi summa sua constet. ... morae in tenebris, sc. 48′ 30″ ad incidentiam h. 1. ... rationem observatam h. 1. 53′, quantam ... negotii testimonia compluria, ...

Interim non dissimulo, si ... ☽ assuma... dentis in antecedentia, moram penes me dimi... nonnihil diminuatur ... observationem ...

[illegible]

Calculus hujus eclipseos ex Tychone.

☉	☽			
[illegible]	0. 2. 22. 39 —	0. 1. 4. 4 —	[illegible] 21. [illegible]	[illegible] 12. 35
[illegible]	5. 23. 24. 34 —	1. 28. 11. 43 —	0. 24. 50. [illegible]	[illegible]
[illegible]	5. 35. 15 —	5. 59. 17 —	2. 1[illegible]. 21. 34	1. 31
[illegible]	12. 11 —	13. 4	6. 3. 49	0. 2. [illegible]
[illegible] 25. 35	6. 2. 34. 39 —	2. 5. 28. 8	13. 14	
[illegible] 21. 35	4. 27. 14	2. 15	11. 28. 51. 56	
[illegible] 21. 4.	1. 3	56	6. 2. 34. 39	
1. 56. 27	5. 28. 6. 22	7	6. 26. 25. 35	
☉ 24. 29. 8 ♎	6. 26. 25. 35	4. 28. 17	1. 0. 8. 18	
	☽ 24. 31. 57 ♈	2. 1. 0. 0	4. 28. 17	
			11. 24. 23. 39	Lat. 31. 9
			5. 11	2. 2
			4. 58	29. 7
			4	

[illegible] 29. 50 Summa 59. 37 — 15. 040
☽ 11. 31 Lat. 29. 7 — 03. 580
[illegible] 31 Scrupula durat. 52. 2 11. 46
[illegible] 46 95000 23. 12
[illegible] 75281 28. 50
21719 Dimidia duratio h. 1. 48′. 17″.

[illegible] exacta calculi oppositio 5′ c. c. nimirum h. 11. 19 aequali.

Adde dimid. dur. 1. 48. Dur. h. 3. 36. Maculi. 3. 17

Computatur finis 13. 7 (5)

Aequatio Tychonica 7. 16 sub.

Addita igitur ad medium finis tempus apparens initii h. 13. 14

Obs. habet 13. 23 vel plus.

[illegible] tempus medium hujus eclipseos quod determinatum h. 11. 32′, id est ex Seve[illegible] adhibito, medio computato ob [illegible] de quo nihil [illegible] dimidiam dur. [illegible] h. 1. 48′, ut habeat aequale [illegible] h. 11. 24′. Sed ut video, tabulae [illegible] [illegible] quoad ultimam phasin c. 9′ praecurrit.

Ex meo calculo sic computo.

[illegible]

versam rationem aequandi tempus, de quo hoc libro [illegible]
sunt mihi cum Tychone communia.

Mirari possis, cur mihi duratio brevior, cum [illegible]
prolixior? Est igitur causa haec, quia mihi videtur [illegible]
latitudo major: major autem ista, propter duas [illegible]
umbra a nodo sequenti, et major angulus excursuum in [illegible]
parum habet quod testetur eclipsis ista, ut in qua [illegible]
duratio quanto auctior fieret, tanto minus ab observato [illegible]
valde contemtum est utriusque dimidiae durationis [illegible]
stellae vel minimus defectus tantum efficit et denique [illegible]
diversorum oculorum multo major est dissonantia [illegible]

Notabimus interim, quod revocato nodo sequente in [illegible]
minor, duratio major.

IV. Eclipsis Lunae anno 1577. 2. [illegible]

Hujus eclipsis observationes Severinius [illegible]
quioribus (quae ut rariores et quarta forma [illegible]
in folio non jungebantur, eoque in meam potestatem [illegible]
sit, quod principium fuerit in ortu h. 7. 0, [illegible]
ob vapores c. horizontem turbidiores, totus vero [illegible]
initium h. 9. 42′, finis h. 10. 44′. Est igitur [illegible]
52′ incertinsculum. At medium inter immersionem [illegible]
h. 8. 54½′, mora in tenebris h. 1. 35′. Et quia [illegible]
in h. 10. 44′ per h. 1. 2½, si tantum est [illegible]
initium cadet h. 7. 5. Ponitur [illegible]

Habeo etiam observationem [illegible]
in illa urbe [illegible]
totalem [illegible]
1½ [illegible]
[illegible]
tione morae primum [illegible] patet, moram [illegible]
h. 1. 35: quae diversitas post [illegible]

Hinc computanda sunt tempora [illegible]
initio morae [illegible]
☽ 11. 12 (computata jam refractione [illegible]
fur). Erat vero tunc ☽ 47′ ante [illegible]
45′ [illegible]. Cum igitur sit verus [illegible]
spondens 29′ 22″ de vero motu [illegible]
[illegible]

Sic pro [illegible], si ☽ visa est in alt. [illegible] vera alt. fuit 6. 59 sine refractione [illegible] 21. 38 [illegible] declinatio

36. 33		1118
23. 40		47034
59. 53		48152
83. 1		
23. 8 —	11. 34 —	160690
142. 54 —	71. 27 —	5335
		166025
		117873
		58937

	67. 22	33. 41
AR ☽	209. 35	
⊙	20. 57	
	111. 16	Horae 7. [illegible]
		Huennae 7. 51

Esset diff. meridianorum [illegible].

[illegible] quantum de duratione seu mora in tenebris Sculteto decesserat, tantum etiam [illegible] vice accedere differentiae meridianorum, ut pene ausimus pronunciare, [illegible] visus sui conditionibus 5′ serius quam Tychonem agnovisse totalem im[illegible], atque ita meridianorum diff. esse 16′ temporis, quod proxime accedit [illegible] geogr. recentiores. Etenim Praga est Huennae ad ortum c. 5′ et Praga [illegible] proficiscentes deflectunt etiam ad ortum, praesertim egressi angustias et [illegible] in regni Bohemici limitibus. Sed relinquantur sane paucula minuta tempo[illegible] in dubio, confirmanda per sequentes eclipses. Quod vero Tycho Prog. II. fol. [illegible] et Huennam sub eundem meridianum confert, id de effectu differen[illegible] est intelligendum in motu diurno cometae, quo de agitur eo loco. [illegible] confirmatum habemus ex 2 locis, medium hujus eclipsis Uraniburgi [illegible] h. 8. 34′; sequitur jam calculus ex Tychone, cujus aequatio tem[illegible] 8. Ergo obs. tempus medium h. 8. 45′.

[illegible]

7½ minutis temporis medii citius, quam in Tychonica [illegible] qui fuit in secunda, propter eandem causam. [illegible] aequationem temporis physice compositam 19′ [illegible] quae igitur addita medio efficit apparens h. 8. 50′. [illegible] quam Tycho, et omnino proxime; sed in hoc propterea [illegible] justificatus.

Parallaxis ☽ 63. 4
» ☉ 1. 0
64. 4
Semid. ☉ 15. 12
Semid. umbrae 48. 52
» ☽ 16. 13
Summa 65. 5
— 17. 920
Diff. 32. 39 — 04. 510

Horarius ☽ [illegible]
☉ [illegible]
☽ a ☉ [illegible]
Latitudo [illegible]
Scrupul. durationis [illegible]

Rursum igitur ut in eclipsi 3. prodit mihi [illegible] vato, sc. h. 0. 56. 33, Mora vicissim longior h. [illegible] lis proxime observatae h. 3. 40. 56.

Si quaeris, cur jam mihi duratio longior, [illegible] longior mihi quam illi semidiameter umbrae. [illegible] longior? Nam mea semid. umbrae demonstrativa [illegible] Tychonis experientialis 46′ 21″. [illegible] brevior, deinde horarius major. [illegible] vera, qua Tycho usus, ego nunquam vidi. [illegible] horarium medium, sc. ex aequatione soluta, [illegible] menstrua in anomalia 90° evanescens, [illegible] malia ☉ 18′ [illegible] sit horario [illegible] fecto; debere utique videtur [illegible] horario illi [illegible] in typum [illegible] Lunarum [illegible] [illegible] est ideo, quia [illegible] sus. Qui etsi [illegible] 24 [illegible]

[illegible]

Calculus Tychonis.

	☉		☽				
1576.	[illegible]. 44. 6	—	4. 25. 11. 29	—	3. 12. 51. 5	—	1. 20. [illegible]. 19
Sept. [illegible]	8. [illegible]. 9. 15	—	0. 27. 7. 13	—	8. 21. 24. 56	—	[illegible]. [illegible]. 27. [illegible]
H. 13.	32. 2	—	[illegible]. 36. 12		7. 4. 37		7. 9. 57
M. 4. 20.	3		41		43		44
	6. 15. 25. 18	—	5. 28. 54. 13	—	0. 14. 19. 55	—	0. 2. 55. 28
	3. 5. 23. 0		1. 38		5.		57. 8
	3. 10. 2. 18		55. 30		1. 38		1. 58. 20
	2. 2. 1		6. 15. 25. 18		57. 8		lat. 10′ 18″
	☉ 13. 23. 18 ♎		☽ 13. 22. 25 ♈		10. 10. 22. 47		

Horarius 27. 14 — — — 78990

Semid. ☽ 16. 1

umbrae 42. 2

Variatio 39

Correcta semid. umbrae 42. 23

Summa 58. 24 + 14. 450

Diff. 26. 22 — 02. 950

Latit. 10. 18 — 00. 400

Scrup. dim. dur. 57. 30 — 13. 090

mor. 24. 15 — 02. 490 — 90593

residua 3. 12 — — — 228500

Mora dimidia h. 53′ 20″ — — 11693

Dim. duratio h. 2. 4′ 40″ 219510

[illegible] tempus aequale h. 13. 1.

Apparens fuit 13. 5. 20

Adde dim. moram 53. 25

[illegible] 13. [illegible] 45. Sed haec propinquitas [illegible] est suspecta, [illegible] si convenerit in dubio quod calculo magis appropinquante, [illegible] incertitudine lineae meridianae.

Ex meo calculo.

☽ 1576.

[illegible] — 5. 18. 14 ☉ 7. 20. 56. 8 — 11. 2. 11. 55 — [illegible]

268. 12. 57

[illegible]

Cor.

[illegible]

Citius tamen agnoscitur egressus. Itaque haec eclipsis [illegible] pulsat aequationem temporis physicam; calculus [illegible] tracto nodo fiat major latitudo, brevior mora, egressus [illegible]

VI. Eclipsis Lunae anno 1578. 15. [illegible]

Severinius exscripsit ex antiquis obs. Tychonis initium [illegible] finem h. 14. 10, medium igitur h. 13. 18½, et duratio [illegible] Prog. h. 13. 17.

Ex Mss. obs. Maestlini: Initio. Fine
Alt. Lyrae 29. 0 — 38. 30
Post. ♊ 11. 35 — 28. 35 [illegible]
Dext. hum. Or. . 30. 48
Hora 12. 7 - h. 3. [illegible]

In exemplari Ephemeridum Maestlini manu auctoris [illegible] in Backnang Wirt. h. 13. 9', quod esset Tubingae h. 13. [illegible] 10½, quod non dissidet a tabulis geogr. [illegible] 2½. Et Maestlinus in Epit. Astr. professus, se observasse [illegible] turam cum distinctione digit. in diam. ☽, ubi [illegible] num Tycho hanc quantitatem transscripserit in summa [illegible] pressis verbis addit, hanc quantitatem sese observasse [illegible] ejusdem eclipsis magnitudinem, juxta modum quem Reinholdus [illegible] amplam."); quam expressit in schemate, quin potius [illegible] sic aeternando respexisse ad calculum vel Prutenicum [illegible] 28½, ut vides in Ephemeride anni 1578. Vel [illegible] computavit, quod pictura exhibet, sc. dig. 2. 20. [illegible] bulo operis Eph. praemittit.

Sequitur calculus ex Tychonis [illegible]

☉ h. 12. 4 [illegible] ☽ [illegible] 35. 37. [illegible]

Horarius 27. 58
Semid. ☽ 16. 15
32. 30 — 61310
[illegible] 35. 025
Variat. 38
Correcta 42. 52

[illegible]

Summa 59. 53 — 15. 100
Lat. 50. 52 — 10. 950
Defectus 9. 1. 4. 250, scrupula durat. dimidiae [illegible]
4. 30½ - 259000 [illegible]
Diam. ☽ 30, 16 68300
Digiti 3. 34 190700 Duratio dimidia h. 1. [illegible]
Major per lat. simpl. tota „ 2. 13.

Vides in utroque calculo prodire et defectum et durationem majores, quam sit observatum; atque haec duo cohaerent invicem, ut quamvis certam et confirmatam quantitatis obs. non habeamus, ea tamen plus quam verisimilem habeat [illegible] a duratione. Atque hoc si fuisset, ad Optices penum hic quoque confugere meditabor. (Vid. Opt. meae fol. 266.) Sit enim duratio dimidia h. 0. 51′ 30″, [illegible] ducta in horarium ☽'s a ☉ 28. 24 procreat scrupula dimidiae

durationis 24′ 24″ — 02. 530
quae cum summa semid. 59. 53 — 15. 480
erunt latitudinem 54. 30 12. 950

Ergo scrupula defectus [illegible], quae sunt digiti [illegible].

[illegible] haec lat. argueret dist. a nodo 9° 55′ etiam in meo magno angulo. At [illegible] nodi per 42′ retroagatur, id per reliquas eclipses fieri nequit. [illegible] testimonia eclipsium acervabuntur, concedendum nobis erit, aut [illegible] in minimis non esse, nimirum hac vice exorbitasse in [illegible], quod promtius comminiscimur, umbram Terrae propter aliquam [illegible], quae facta sit in materia inter ☉ et ☽ interposita, [illegible]. Non enim sufficit illa refractio, quae fit in aëre nostro: nam etsi illa [illegible] umbrae intrudit, aër ipse tamen projicit umbram nihilo[illegible] a ☉ margine [illegible], atque ita umbra sentitur initio et fine [illegible] possimus. [illegible] et provolemus ad audaces hujusmodi [illegible] difficultas existit, [illegible] poterit, ut [illegible] ☉ altitu[illegible] Tycho [illegible], si interdum interjecta substantiae [illegible] Terrae [illegible]

[illegible]

Quae de colore hujus eclipseos ipse [illegible]
in Opticis meis fol. 302.

[illegible]

☉ [illegible]° [illegible]′ 20″ ♒. ☽ 21° 29′ 8″ ☊ [illegible] Anom. [illegible] [illegible]

Horarius 29. [illegible]
Semid. ☽ 16. 17
umbrae [illegible]. 27
Vir. [illegible]

Summa [illegible]. 51 — 14. [illegible]
Diff. 27. 10 — 03. [illegible]

Haec igitur eclipsis fundamentalis [illegible]
datus, ut eam exacte repraesentaret [illegible]
et durationis [illegible]

[illegible]

[illegible] in constituendis semidiametris ☾ et umbrae. Ecce enim Tycho [illegible] gratiam quarundam observatarum eclipsium diminuit umbrae, auxit ☾ semidiametros; et illas quidem tunc expressit observationes, at jam ne sic quidem obs. [illegible] ejus eclipseos exprimere potest.

[illegible] positis hisce: duratione sc. dimidia h. 2. 1′ ut observatum, et mora dimidia 0. [illegible], ut et assumto horario 27′ 14″ et semid. ☾ 16. 0, [illegible] invenire, videre, quanta conficiatur lat., quanta semid. umbrae ex theoremate, quod a Hipparcho demonstro. Nam si horarius tantus, respondebunt scrup. durationi [illegible] 54′ 55″, morae vero 19′ 4″; horum quadrata sunt 50′ 16″ et 6′ 4″, ut [illegible] diff. 44′ 12″ esset semid. umbrae, unde ablata semid. ☾ 16. 0. restaret [illegible] 12″ cujus quadratum 13′ 15″, unde ablato quadrato 6′ 4″, restaret 7′ [illegible]″ quadratum latitudinis, et lat. igitur 20. 46 (v. s. p. [illegible]1). Quanta hinc perturbatio, [illegible] velles corrigere in Tychone semid. et lat. eoque etiam locum nodi? Et a [illegible] tunc standum, si singulae observatae, nec se peculiarem correctionem poposcissent hac methodo examinatae?

Jam igitur [illegible] calculum.

☉ 10. 4.[illegible] 2° 23′
[illegible] 7. 44.[illegible]
[illegible] 39 Reduct.
[illegible] 10. 4. 19 Requ.
[illegible] 12. 28.

Parall. ☾ = [illegible] (+ par. ☉ = 1′ 1″) = [illegible] 27
Semid. umbrae = 59. 27 — semid. ☉ [illegible] = 43′ 58″
[illegible] 43. 58 + 15′ [illegible] ☾ = 58′ 58″ — 14. 710
[illegible] 43. 58 — 15′ [illegible] = 28′ 58″ — 03. 550
Latit. = [illegible]. 11 [illegible] 06. 740
Sc. dur. dim. 57. 27 — 12. 970
„ mor. „ 25. 43 — 0[illegible]. 810

[illegible] Log. 27′ 27″ = 78200
[illegible] „ 2. 33 = 316
[illegible] Dur. dim. h. 2. 5. 34
[illegible] 25. 43 = [illegible]
[illegible] Mora [illegible]

[illegible] 10. [illegible] [illegible] quia [illegible] [illegible] loco [illegible]; sed [illegible] [illegible] 2′ 40″ [illegible] observationem [illegible] duratio [illegible] paulo [illegible] observatam, quanto [illegible] de observata [illegible] morae [illegible] quam Tychonicae [illegible] [illegible] observatam 28′ propter easdem causas ob quas et Ty- [illegible]

[illegible]

expressum est h. 16. 57′, quod per Tychonicas [illegible] h. 17. 6′ 12″.

Sequitur calculus hujus eclipseos [illegible]

☉ 2° 43′ 29″ ♌ ☽ 2. 42. 6 ♒ An. 4 [illegible]

Horarius ☽ 34. 29 — 55390
Semid. ☽ 17. 48
Umbrae 46. 29
Var. [illegible] — 62. 650
Summa 64. 13 — 17. [illegible]
Scrup. d. dur. 59. 8 — 14. [illegible]
59′ 8″ - 34′ 29″ = 24. 39 — [illegible]
Dur. dim. h. 1. 42. 53 — 33560.

Sequitur calculus [illegible]

Calculus [illegible]

☉ 2. 42. 59 ♌
☽ 2. 42. 10 ♒
Requis. 2. 44. 50
☊ 28. 18. 27 ♑
4. 2[illegible]. [illegible] Lat. [illegible]
[illegible] Red. 23. 3
[illegible]

Horarius ☽ 37. 44
[illegible]
[illegible] 25. 25 — [illegible]
Dim. qu. 1. 43. 7 [illegible]

[illegible] = [illegible]

Durationem computo eandem, [illegible] diameter majorque horarius, in sequ[illegible] nicum supera, superarem [illegible] [illegible]

[illegible]

h. 15. 0. Duratio [illegible]
h. 18. 12. Severin[illegible]

... Tycho et Witichii Mathematici perquam ingeniosi et industrii ... habitam, sed in quam vitium irrepsit in duratione et mora, ... brevioram quam Tycho. Sed si ponatur finis ... h. 14. 45', finis morae h. 13. 45', diff. medii erit 15', quod tabulae ... 14'.

Calculus Tychonis, cujus aeq. [illegible] 9' 22'' sub.

[illegible] 10 ♏ ☽ 25. 54. 12 ♉ An. 4. 6. 21. 0 Motus lat. 6. 2. 8. 0 Lat. 11' [illegible]

49. 10

5. 2 Horarius 33. 6 Summa 61. 19 — [illegible]

Semid. ☽ 17. [illegible] Sem. d. dur. 31. 41 — [illegible]

umbrae 45. 44 Diff. 27. 21 [illegible]

[illegible] h. 1. 51. 49 dur. dim. Var. 54 Sem. mor. d. 24. 57 [illegible]

, umb. corr. 44. [illegible]

. 21 . 78660

19660

h. 0. 49' [illegible]'' mora dimid.

Calculus praevenit tempus hujus eclipsis 9', durationem colligit [illegible] minorem ..., tempus incidentiae h. 1. 2'.

Calculo vere meo sic computato. ⊙

[illegible] 1. 7. 8. 1 — [illegible] 12. 42. 1 — 8. 10. 20. 22 1584. 10. Jan. h. 19. 15'.

[illegible] 7. Nov. „ 13. 6.

d. 148. h. 17. 51.

[illegible] decate" et pictura habet 3 dig. [illegible]
[illegible]." Hoc igitur momento ☽ jam dudum [illegible]
[illegible] in duobus observatoriis, ☽ totam [illegible]
in duo: „utrum autem prius totaliter egressa, [illegible]
nere non licuisse." Finis igitur fuit ante hoc momentum, [illegible]
ante h. 9. 39'. Hora quidem 9. [illegible] ☽ [illegible]
minus quarta diametri, id est paulo post medium [illegible]
Nam h. 8. 47' quasi quarta superfuit, iterumque h. [illegible]
[illegible] phasis conspecta fuit; inter ista medium est [illegible]
[illegible] ante h. 9. 39' ut supra. Hoc igitur probabile [illegible]
[illegible] medium h. 9. 16, quod [illegible] jam [illegible]
pora, quae ubique observabantur, esse verificata [illegible]
se ex 3 locis intra minutum unum.

Calculus Tychonicus, cujus aeq. t. 2. [illegible]

☉ 5. 25. 8. 40 ☽ 5. 23. 51. 57 — 10. 1. [illegible]
[illegible] 5. 30. 0 [illegible] 12. [illegible]
2. 19. 38. 40 1. 4
2. 0. 22 [illegible]
☉ [illegible] 5. 25. 8. 40 — [illegible]
☽ 23. 11. 41 ♓ 33000
9. 5
Diff. 2. 36

Sr. [illegible] sunt 29. 55
15. 0 — 188700 Horae [illegible]
32. 50 — [illegible]
Digiti 10. 56 780[illegible]
[illegible] 9. 45 [illegible]
At [illegible] plus.
Residui 3 minus,
quod est quasi minus
quarta diametri.

[illegible]

[illegible] h. [illegible] 14 [illegible] h. [illegible] 26'
[illegible] h. 7. [illegible], relinquunt h. 7. [illegible]. [illegible] 2 vel 1. Adde, quod duratio [illegible]

Sed venio ad meum calculum.

[illegible] 8. 20 — 0. 17. 25. 40 — 6. 13. 25. 59   ☉ 1587.
17. Jun. h. 13. 56' — [illegible]
8. Sept. [illegible] 22 [illegible] ☉
[illegible] 1. 2[illegible]
[illegible] 13. [illegible] — 1. 6. 41. 57 — 0. 14. 25. 22   d. 80 — [illegible] — ☉ [illegible]
[illegible] 29 — 1. 18. 7. 57 — 5. 28. 50. 30   [illegible]
[illegible] 25   1. 24. 37. 3   14. 22   [illegible]
[illegible]   21. 12   25. 0 Corr.   21278
[illegible]   ☽ 2[illegible]. [illegible]. 22 ♓   ♌ 2[illegible]. 29. 52 ♍   23478
[illegible]   Req. 23. 9. 4   ☉ 23. 7. 25
[illegible] ☽ [illegible]. 27   6. 22. 27. lat. 0. 35. 14, simpl. 33. 17
[illegible]   1. 39 Reduct.
60. 27   23. 9. 4
[illegible] ☉ 15. 13   Horar. ☽ 31. 33
[illegible] umbrae 45. 14   ☉ 2. 27
[illegible] 17   ☽ a ☉ 29. 6   72300
[illegible] 15. 490
[illegible] 05. 250
[illegible] 25. 17   10. 240 — 49. 12

In quantitate melius sto quam Tychonicus per 1 digitum, abundo tamen adhuc [illegible] plus [illegible]. Nec [illegible] latitudine et [illegible] eclipsibus.

[illegible]

Denique in tertio observatorio penitus [illegible] in h. [illegible] per 1. [illegible], medium est h. [illegible] jam altera parte lucidiorem ☽ fuisse, quasi non [illegible] hac de diversitate querelas vide Astr. Opt. fol. 303, [illegible] a me pro captu puerili observata commemoro.

De observatione latitudinis et distantiae a fixis [illegible] ad calculum Tychonis, cujus aequatio temporis 2′ 20″. [illegible]

☉ 11. 20. 49. 26	☽ 6. 6. 42. 20. 3. 20. 2. 43	0. 7. 53. 21	[illegible]
8. 5. 20. 30	4. 43. 8 1. 42	4. 43. 8. [illegible]	
♍ 8. 15. 18. 42	8. 1. 20. 12 4. 43. 8.	0. 8. 10. [illegible]	
2. 0. 13	11. 20. 46. 23 3. 15. 10. [illegible]	Lat. 10. [illegible]	
☉ 22. 49. 36 ♓	☽ 20. 46. 35 ♍		

[illegible]

Ergo calculus Tychonis plane assequitur h. [illegible] [illegible] 1. 3. 42 [illegible], quae superat observatam per [illegible] 1. 22, quod congruit.

Cum vero semper [illegible] duratio [illegible] [illegible] observatam, non [illegible] eclipsi [illegible] prolixiorem? Anne [illegible] in umbram immersa, sed magis ad latus [illegible] [illegible] quibus [illegible] [illegible] tota [illegible] in [illegible]

[illegible] In illa vero [illegible] [illegible] est 25° [illegible]

[illegible]

[illegible] per hanc veram lat. prodire etiam durationem proxime aequalem [illegible]. Mora vero fit per Tychonicum 10′ minor, quam [illegible], quam [illegible] dixit.

Sequitur calculus meus.

Pro ☉ — 1587. ☽

Jan. h. 20. 12 — 5. 30. 47 ♋ Feb. Bis. 1. 21. 43. 11 — 2. 0. 24. 21 — 5. 23. 0. 18
Mar. 15. 3 — 12. 23. 14 d. 61. 15. 3.
106. 5. 9 12. 46 63. 12. 46. 11
59. 39 ☉ 22. 49. 45 ♓ Revol. II. 55. 2. 37. 10 — 0. 6. 8. 24 — 0. 1. 55. 6
[illegible] + 153900 8. 10. 9. 1 — 2. 6. 32. 45 — 5. 20. 5. 12
= [illegible]4485. 33. 48 8. 16. 7. 7 25. 25
Parall. ☽ 61. 43 Horar. ☽ 35. 10 57400 5. 5 1. 20
☉ 1. 0 ☉ 2. 29 189500 22. 44. 57 ♍ Cor. 25. 0
[illegible]. 43 ☽ a ☉ 32. 41 246900 Req. 22. 49. 0 ♌ 20. 3. 27 ♍
☉ [illegible]. 16 60750 4. 3 ☉ 22. 49. 45 ♓
[illegible] umbrae 47. 27 28. 46 — 73510 2. 46. 18
☽ 15. 52 27. 35 — 77713 Reduct. 0. 46
Summa [illegible]. 19 — 16. 960 12760 Duratio dim. h. 4. 52. 46 Requis. 22. 49. 0
Diff. [illegible] — 04. 220 [illegible] Mora dim. 0. 50. 38. Lat. 15. 18
[illegible] 15. 49 — 01. 000 Simpl. 14. 27
[illegible] 21. 27 — 15. 960 Duratio [illegible]
27. 35 — 03. 220

[illegible] prodit [illegible] major observata, mora vero 1. 44′, [illegible] quia [illegible] habeo magnam, diam. ☽ parvam. Sed [illegible] eam, [illegible] observationi, tunc [illegible] fuint. —

[illegible] igitur tempus ☍ aequale sequitur post 7′, quia [illegible] aequationem [illegible] perigaeum. Sed physica temporis aequatio est 10′ 40″ [illegible], [illegible] constituit medium h. 15. 20½′ apparenti. Convertitur [illegible] temporis [illegible]

[illegible] 15. 960 04. 220
14. 02. 000 02. 000
[illegible] 14. 370 02. 120

[illegible] 60750 Ser. dur. 22′ 20″ [illegible]
[illegible]
[illegible] 21125 [illegible]
[illegible] dur. dim. [illegible] 0. [illegible]

[illegible]

[illegible] ipsum medium fuit haec distantia [illegible] 28° 9′, potius 28° 11′ [illegible] ad praecedentia [illegible] 28° 14′, igitur ipsa h. 15. 0 fuerit 28° 12½. Hic jam prius [illegible]

Asc. R. ⊙ 353° 25′
H. 15. 225.
90.
Asc. obl. hor. 308. 25
Latus aequat. 51. 35 — 24397
Alt. aequat. 34. 5 — 57911 — [illegible]
[illegible] — [illegible] Ang. orient. [illegible]

Cum igitur centrum ☽ distiterit a [illegible] per 28° [illegible] nica, fuerit vero versus occasum et per ♌ [illegible] 22° 46′ [illegible]. Aufer hinc distantiam dictam uno minuto [illegible] prodit 24° 12′ ♌ locus stellae, tribus saltem aut [illegible] Ita confirmatur nobis long. [illegible] promotior per [illegible]

[illegible] fer semid. ☽ Tychonicam, erit inter centrum [illegible] [illegible] 38′ [illegible] [illegible] 25° [illegible] haec stella promotior, sed non tanto quanto [illegible] margo cernitur, quare instrumenti [illegible] neum est, non in merum limbum, ut [illegible] cerni possit. Hoc pacto illic plus [illegible] 11, sc. 7 valeat. [illegible]

Ex iisdem distanti[illegible] licet [illegible] nicus est 31′ 48″, [illegible] 41″. [illegible] [illegible]

[illegible] Veniam, at multo ante h. 16. 20', [illegible] in [illegible] Lat. tarde [illegible] digiti.

Calculus Tychonis.

[illegible] — 6. 2. 38. 17 — 4. 14. 22. 10 — 5. 22. 55. 11

2. 39. 16 — 3. 38 — 3. 37. [illegible]

1. 21 — 3. 37. 55 — 5. 19. 17. 16

3. 37. 55 — 4. 10. 44. 15 — 21. 32

☉ [illegible] 5. 29. 0. 22 — 5. 19. 38. 48 Lat. 55' 12"

2. 24. 35. 24

Dif. [illegible] 44 — ☽ 22. 35. 46 ♑

Horar. [illegible] 34 — Oppositio contigit post 37' 3" h. 16. 57' aeq. Uranib. ☉ 23° 57' 12" ♋.

100250 Semid. ☽ 17' 35" — 16. 49½ apparenti

[illegible] Umbrae 46. 2 — 56⅔

[illegible] 63. 37 — 17. 120 — 15. 53 initium. Tubingae h. [illegible]. 42'

Latit. 55. 12 — 12. 900

Scr. defic. 8. 25 — 4. 220

Scr. dur. dim. 31. 34 — [illegible]

Dur. dim. h. 0. 56. 25 — [illegible]

[illegible]

4. 13 — [illegible]

35. 10 — [illegible]

212 [illegible]

Calculo meo.

[illegible] 7" ☉ — Ergo maxima obscuratio h. 17. 9'

[illegible] ♑ — aequali. Minutis 43 sequor Tychonicum

[illegible] — in observatione maxime, quia verum

[illegible] lat. 59' 20", [illegible] — perigaeum magnam aequationem subtraho, [illegible] ☽ motum propterea maximam [illegible].

[illegible] 46 — Horarius ☽ [illegible]. 27

[illegible] — [illegible] 2. 24

[illegible] 45 — ☽ a [illegible] 39 — [illegible]

[illegible] ☉ 15. 2 — Scr. durat. [illegible] 8 [illegible]

[illegible]

Aequatio [illegible] 11' 46" add. ergo h. 16. 12'

[illegible] Tubingae vero h. 1[illegible]. 1'.

[illegible] vario 19' [illegible]

[illegible]

humerus Orionis a meridiano in orientem remotus [illegible] recta anno 90. esset 83° 18½′, ablato intervallo [illegible] Hinc aufer 40′ pro 2′ 40″, restant 61° 57′ tempore [illegible] habet asc. rect. 290° 43′, diff. 131° 14′ conficit h. 8. [illegible]

Etsi coadjutorum unus ante 3′ pronunciaverat ☽ [illegible] reclamante, Severinius finem assumsit h. 8. 40″. [illegible] phasium se invicem sequuntur, annotatis ubique [illegible] est ubi et altitudine ☽: initium tamen deest, [illegible] paulo plus dimidio diametri ☽ in umbra et cornu [illegible] pingitur, horologii quidem indicatione h. 6. 5′, sed [illegible] quando Aldebaran a meridiano abfuit 30° 1′, [illegible] h. 6. 49½′, ut ita phasis dicta congruat horae [illegible] premi marginis ☽ 20° 25′ cum declinatione 21 [illegible] 84° 22′. Etsi vero ☽ est vere ante ☉, at visibiliter [illegible] in ☍ ☉. Et simul habet lat. merid. estque parallaxi [illegible] Si igitur ipsum punctum eclipticae ☉ oppositum [illegible] Sed propter dictas causas aliquot scrupulis minus [illegible] schema dicitur paulo minus quarta parte superficiei [illegible] quidem paulo etiam ante pars residua [illegible] cornu congruebat medio circiter, erat [illegible] versus sinistram. Sane h. 7. 33 supra cornua [illegible] Et schema X. exhibet h. 7. 46′ eandem [illegible] hoc pacto medium fuerit h. 7. 0. Exitus umbrae [illegible] dium in Prog. adscriptum est h. 6. 53′. [illegible]

Calculus Tychonis, cui aequatio est [illegible]

☉ 19. 8. 6 ♉ ☽ 19. 21. 59 ♏. Anom. 9. 1[illegible]

[illegible]

H. 1. 45. 18 [illegible]

Dim. duratio 33. 28 [illegible]

[illegible]

Medium ergo calculo Tychonis [illegible] utcunque sint ista [illegible] nihil ultra [illegible]

[illegible]

[illegible] sequitur meus Tychonicum in tempore medii aequali $3\frac{1}{2}'$, quia aequatio [illegible] mihi est eadem, reductio vero ad metam obscurationis maximae totum con[illegible] Latitudinem habeo majorem, quia et angulus mihi major et nodus magis in [illegible] a ☽ distans. Hic etiam dimidia duratio mihi minor, essetque multo [illegible] nisi mihi auctior umbra, diminutior ☽. Nec multo tamen mihi minor de[illegible] multo major latitudo. Nam scrupula quidem defectus pauciora habeo, at [illegible] ☽ diametrum breviorem.

[illegible] vero observationem attinet quantitatis defectus, illa sane utrumque nos[illegible] fortiter, magis tamen Tychonicum. Minor enim fuit, major igitur [illegible] ac proinde nodus promotior, quippe ☽ sequens. Accedit igitur haec [illegible] posteriorem, in qua sunt IX, X, XI.

[illegible] tamen etiam declinationem in prima phasi observatam, an ea [illegible]. Si enim supremi cornu declinatio fuit $21° 2\frac{1}{2}'$, alt. vero $20° 25'$, [illegible] inter azimuthalem et circulum declinationis fuit $36° 30\frac{1}{2}'$. Et quia pa[illegible] ☽ fuit $60' 16''$ mihi, alt. vero ☽ cornu superioris $20° 25'$, ergo parall. [illegible] $56' 30''$. Haec cum sit basis trianguli rectanguli minimi, cujus jam [illegible] expressus est, quare alter angulus erit $53° 29\frac{1}{2}'$; huic autem ob[illegible] declinationis: haec igitur fit his principiis $45' 25''$. Vera igitur [illegible] cornu sept. fuit $21° 48'$; aufer partem proportionalem collectam per ☽ secundum me $15' 30''$, sc. $12' 28''$, restat decl. centri $21° 35' 32''$. [illegible] quod hac vice centrum ☽ visum sit in loco ecliptico penitus ☉ op[illegible] $19° 6'$ ♋, cum his declinet $22° 9'$, distaret igitur centrum ☽ ab [illegible] in circulo declinationis $33' 88''$, et quia angulus eclipticae cum hoc cir[illegible] loco via brevissima distaret per $33'$ et haec esset vera lat. [illegible]. At si parallaxis long. vel asc. recta superaret diff. long. [illegible], ita [illegible] sit jam ultra ☍ ☉, locus ejus eclipticus paulo minus [illegible] [illegible] centri ☽ erit paulo minor quam $33'$. Post horam igitur [illegible] Luna propior nodo facta haberet lat. [illegible] Tychonis, cum tamen ipsa quantitatis observatio [illegible] tunc lat. esse majorem. Hunc igitur dissensum tribuere possumus diffi[illegible] observandi declinationem [illegible] cornu. [illegible] observator, ne [illegible] ☽ [illegible]

[illegible]

guntur in primis 2 phasibus pictura rudi et saepe [illegible] bito ad dextram est reclinis species idque, evide[illegible]

Data igitur distantia ☽ a Nonag. visibili [illegible] et insuper alt. centri ☽ visa 20° 9′, dabitur ang[illegible] cam praeter propter. Nam ☽ in austro est, non in [illegible] pro 42° usurpabimus 43° 20′ quasi ducto circulo [illegible] His principiis angulus iste fit 46° 58′. Posito ergo [illegible] guem erecto, angulus inter diacentron et eclipticam [illegible] erit 43° 2′. Et quia centrum umbrae distat [illegible] terfuit inter centra semidiametro umbrae, minus [illegible] Tychoni adhuc minus. De hac vero ut bene [illegible] respondet longitudini quidem 83′ 26″, lat. [illegible] set in latitudine, si phasis fuisset exacta, et [illegible] nica quidem parvitas sufficeret, cum tamen [illegible] postulet mea etiam magnitudine. Non fuit [illegible] versus dextram a supra, quod tertium schema [illegible]

Ex eo vero, quod obvenit longitudini, colli[illegible] Lunae locum visum fuisse jam ultra [illegible] durationis certius aliquid pronunciare possum[illegible] quare a horam abfuit observatio maxime [illegible] nadere in phasi fuerunt cornua.

[illegible]

[illegible]

Calculus Tychonis. Aeq. [illegible] 40″ adde.

[illegible] ☽ 3. 18. 29 ♑ 1ˢ 1° 29′ 11. — [illegible] 16. 7. Lat. [illegible]

[illegible] Digiti 9. 25. Sem. dur. dim. 48. 17. [illegible]

Dim. dur. h. 1. 45′ 0″. [illegible] Mer.

[illegible] id exhibet pro aequali tempore medii, quod est in Progym. [illegible]

[illegible] duratio fere per h. ⅓ superat observationem, et sic finem observatum [illegible] assequitur. Quantitatem etiam refutat Braheus, qui non 7 dig. totos [illegible]. Ergo latitudo major nodusque antecedens remotior fuit in antecedentia. [illegible] est protocollo observatio Witebergae habita a Chr. Joh. [illegible]pensi, [illegible] Tychoni inservierat, sine initio et fine eclipsis, qui cum maximam [illegible] dig. ut habet calculus. At pictura haec est in cornibus supinis post [illegible] respondent ceterae figurae, nec quicquam de quantitate verbis expri-[illegible] etiam dimensus sit partem residuam. Ultima illi phasis [illegible] in defectu, cum Vultur esset orientalior medio coeli per 16° 15′, ut [illegible] R. M. C. 276° 20′, ⊙ 93° 38′. Tempus igitur arguitur h. 12. 11′, finis [illegible] h. 12. 18′, quasi sit diff. meridianorum 20′, quod multum repugnat tabulis [illegible] est igitur fide digna observatio.

Calculus meo. [illegible]

[illegible]

Sed ☽ in fine eclipsis superavit locum ... ergo est in 4° 7′ ♋, qui declinat 23° 28′; ... meridiana. Vides autem ex ipso processu, tantum ... nuitur haec assumta refractio; et est quidem in ☉ ... non semper constans. Digiti quidem 7 cum mea ... latitudinem in medio desiderant 24′ 18″; distantiam a ... 7° 40′; itaque ☊ esset hac vice in 25° 35′ ♊, non vero ... scrupula durationis erunt pauciora sc. 42′ 15″ et ... et observata.

Imprimis vero evidens est phasis h. 10. 40′ ... superfuere in lumine 15′, quorum tota diameter ... in margine umbrae, et utrumque centrum in eodem ... centrorum aequavit semid. umbrae 44′ 43″, nec ... eclipticam. Aufer enim ab asc. recta oppositi ☉ ... 18. 20′, restat A.R. medii coeli 255° 3′ et A.R. ... 19° 18′ et distantia ☽ ab eo 45° c., ...

79° 3′	— 1854	— 165606	
45.		84260	
	920	— 290260	
82. 11. —	934	— 198500	
	29400	— 29400	
44′ 15″ —	30334 ... 5″ —	226900	

... angulum ☉ ... ita ... quae in ... ☽ ... 15′ ... h. 10. 3... ... medio ... latitudini. Et simul eclipsis medium ... vationum ...

XVI. Eclipsis Lunae anno 159...

Uraniburgi ... nubilum ... quin ... decedere visum. Deinde ... H ... liber erat, ut ... Hora ... 9. ... umbrae ...

At ... in ... Tycho ... 24 ... 8. ... in ... h. ...

[illegible] 64, [illegible] — 18. 150

[illegible] 14. 816. (52'. 54") [illegible] 4. 15

[illegible] 7. 37. 30

[illegible] h. 8. 41. 45 aeq.

8. 41. [illegible]

Colligo medium h. 7. 37½' aequali.

Horar. ☽ [illegible]

☉ [illegible]

☽ a ☉ [illegible]

13'3[illegible]" — 1[illegible]

36' — 51[illegible]

22'32" — 979[illegible]

Si [illegible] est huic animadversioni Tychonis, quod ☽ quasi media in umbra est visa, [illegible] hic requiretur minor eoque [illegible] antecedens promotior in consequentia, [illegible] eadem recidit, minor angulus [illegible] ad latera [illegible] vice.

[illegible] eadem, licet per diversa quantitatis principia, sed [illegible] per 15' c., sicut et in praecedenti.

[illegible] VIII. Eclipsis Lunae anno 1584. 18/28. Oct.

[illegible] 2 observatoriis initium Uraniburgi deprehensum est h. 12. 54' [illegible] versus dextram. Hora 18. 35' Tychoni, [illegible] in umbra fuit conspecta, [illegible] defectus, [illegible] ad 9 digitos h. 13. 45'. Exinde ☽ [illegible] usque in h. 13. 17', cum [illegible] in altum. [illegible]

[illegible] in Frisia Or. pago [illegible], qui 2' orientalior est Emda, habens [illegible] observavit alt. Sirii, cum parum jam incepisset, 18°. 10'. Hinc [illegible]

60. 37   2[illegible]

Semid. ☉ 15. 24   [illegible]

Umbrae 45. 13   [illegible] — 29′ 26″

☽ 15. 20   [illegible] — 41. 51

60. 33. 15. 72[illegible]

Lat. 35. 14. 05. 2[illegible]

10. 476 Dim. dur. h. 1. 41. 51

S[illegible] 10. [illegible] Mediat[illegible]

4[illegible]   ductione 10. [illegible]

2[illegible]. 15   17. 23[illegible]

[illegible] 28. 26″

Et quia defectus usque ad dodrantem 28′ 6″, recte sane fit, quod uterque [illegible] fere 28[illegible] verus 29′ 19″ [illegible] horizontem subeuntis, quae [illegible] non pervenisset ad 10 dig., possetque etiam in [illegible] aucto angulo vel [illegible] fieret et finis aliquot [illegible] ☉ h. 19. 15″. [illegible] ortui ☉, [illegible] h. 17. 2[illegible] [illegible]veris [illegible] h. [illegible], et [illegible] [illegible] nodum [illegible]

[illegible] in [illegible] [illegible] magis ad latus [illegible]

[illegible] cum ecliptica [illegible] [illegible] visus [illegible] lat. 0° 50′ [illegible] [illegible] 251° 40′ et in Nonag. [illegible] [illegible] 12°.

[illegible] 0 — 157064 78. 0. 0 — 2209
[illegible] 0 — [illegible]731 1. 3. 9 — 399710
[illegible] 3. 9 — 399710 401919
[illegible] 651505 1. 1. 45 parall. lat.
[illegible] 5 parall. long. 0. 56. 17
[illegible] 30 lat. 0. 5. 28 sept. vera.
[illegible] 15. 35 [illegible] vera.

[illegible] h. 12. 6′ 30″ in h. 15, 6′ per horas 3 deprehenditur ☽ [illegible] [illegible]. Et si nulla refractio subtrahatur, in lat. sept. decrevit per 6′; [illegible] debuit decrescere per 10′ 24″, quare si utrinque justa fuit ob- [illegible] excessus refractionis in ☽ humiliori 4⅓′ in lat. At si magis [illegible] proximae, quae lat. habuit 15′ 30″, tunc perexiguus [illegible] variatae refractionis: interim hoc nota de utraque vice, Lunae [illegible] detractis refractionibus fore minorem.

[illegible] 45 tota in umbram ingressa visa est per 3 observatoris con- [illegible] in incidentia 50′ cum jam illucesceret; nec ex eo quid [illegible] ☉ enim h. 16. 42 oritur ea die.

[illegible] Brunsvicensis in urbe Brunsviga observavit [illegible] Colligitur h. 14. 30. [illegible] quod repugnat [illegible], possunt enim [illegible] Sed exspectabimus plura suffragia. [illegible]

[illegible] coepit in alt. Arcturi 24° e. (astrolabio papy- [illegible] ☽ [illegible] 15° 30′ [illegible] [illegible] per [illegible] h.

[illegible]

[illegible] Medium [illegible] est h. [illegible] ☽ [illegible] ♉.

[illegible]

Copulam mediam compute 6′ citius [illegible] instrumentis [illegible] observata. [illegible] 32″ aequali et per aequationem temp. physicam [illegible] h. 14. 53′. Quod latitudinem attinet, etiamsi [illegible] prodit removeam, manet tamen in medio septen[illegible] hic nodus in consequentia promoveri, ut pro me[illegible] idque non argumento [illegible], quae parum mut[illegible] cunque nodum moveas, sed sola observationis [illegible] insolita et valde insigni refractione [illegible] passurae sunt istae observationes. Refractionis [illegible] horizontem subito crescat, etsi magna admodum [illegible] quando fuit altissima totius illius noctis [illegible] animadverti refractionis hujus diversitatem. [illegible] Hac vero deprehensa est magna refractionis [illegible] aut plane nulla, ut superius ex ipsis observationibus [illegible] igitur est, promotiorem hoc loco nodum [illegible] anctione, solus nodi situs in culpa est.

Pro fixarum locatione nota, quod [illegible] sit ☽ in 2° 16′ [illegible] nec [illegible] pars est parallaxis, cum ipsa [illegible] [illegible] ☽ [illegible]

[illegible]

[illegible]

[illegible] 18. 26. 38 Sept. 278. 20. [illegible]

11. 11 [illegible]

0. 15. 11, 16 — 0. 7. 33. 47 [illegible] 22. 42. 50

30. 10 6. 44 2. 1

☽ 24. 15. 56 ♈ [illegible] 25. 0

Reliqu. 24, 15 38. ☊ [illegible] ♈

☉ 21. 15. 57

1. 10. 8

Semid. ☉ 15. 21 Horar. ☽ [illegible] 0

Umbrae 44. 4 ☉ 2. 30

☽ [illegible] ☽ a ☉ 27, 30 — 78000

Lat. 0′ 28″ S

Simpl. 6. 4.

[illegible] — 270000

[illegible] aequali 290000

[illegible] Aeq. phys. [illegible]

[illegible] 8¼ appar.

[illegible] observationem 25½′, quassaturque aeq. physica, [illegible] excipiam, quod alio tempore [illegible]

[illegible] 1590 [illegible] vesperi [illegible]

[illegible]

Calculus minor

☉ Jun. H.		☽
Apr. 2. 9. 16	— 11. 57. 13	Bias.
D. 75. 42. 51	31. 20	
58. 32	☉ 23. 15. 23 ♈	
62470		
Parall. ☽ 63. 35		☽ 38. 24
☉ 1. 0		☉ 2. 28
64. 35		☽ a ☉ 35. 56
Semid. ☉ 15. 18		
☽ 16. 20		
65. 42	— 18. 270	
Lat. 52. 17	— 11	
Scr. def. 13. 25		dim. dur.
Sc. dim. dur. 30. 48	— 06. 700	
		Initium h. 8.

In aequali tempore medii plane ... tionem versus perigaeum subtraho, ... tantundem antiquo. ... Quod si minuatur latitudo, ut defectus ...

[illegible] phasibus quibusdam ad ingressum et egressum [illegible] h. 18. 4'. At huic consignationi juncta est in [illegible], [illegible] missum a M. Joach. Rudenisio, quae [illegible] ingressum et egressum, et per ejusdem Arcturi [illegible]. [illegible] 55° 42' cum quadrans in umbra esset, et 54° 32' cum [illegible] [illegible], et 52° 27' cum dodrans. Inde nubes; at post [illegible] [illegible] ☽ fuit 2° exacte. Additur: respondere tempora, h. 4. [illegible], [illegible] pro dodrantibus h. 5. 18' et h. 6. 49'; ut sit medium h. 6. [illegible]. [illegible] ipsa esse observatio, cujus summam Severinus scripsit. Quodsi [illegible] phasin semissis h. 4. 51' cum mea obs. h. 5 paulo plus, vel per [illegible] h. 5. 25' paulo plus: dabitur animadvertere diff. meridd. inter Rosto- [illegible] vel 9' plus, vel 34' plus. Unde facile patet, nimiam esse meam [illegible], nec tamen nullam omnino statuendam; tabulae enim requirunt c. 17'. [illegible] Tycho Wandesburgi, quod non amplius quam ⅓ mill. Hamburgo distat [illegible] poli 53° 46', initium signavit alt. superioris limbi ☽ 28° 30'; itaque [illegible] [illegible] ipso ☽ hinc elicuit h. 16. 12', quod esset Uranib. h. 16. 25' ex fide [illegible] comparata cum mea obs. h. 4. 35', vel h. 5. 0' per correctionem, [illegible] meridd. 39' vel 48', quae discernuntur ex superioribus; nam tabulae [illegible], [illegible] semissis obscuraretur, caput Ophiuchi a meridiano [illegible] [illegible] sit ejus AR. 259° 2', erit AR. med. coeli 282° [illegible], [illegible] relinquit 258° 11'; hora est 17. 13'. [illegible] vero phasis [illegible]

[illegible]

[illegible] 18 in Astr. parte Optica [illegible] fol. [illegible] 266 et ad Cap. VII. fol. 202 et ad [illegible] [illegible] fol. 302 [illegible]. In hac [illegible] [illegible] in lumine [illegible] in prolegomenis [illegible] exemplo eclipsis simili diversitate observatae, [illegible] tamen quid in partem etiam alteram [illegible] [illegible], lucem illam imbecillem seu [illegible] [illegible] [illegible] horizontibus [illegible] observatorum oculis [illegible] [illegible] et aqueo aëre sic delituisse, ut etiam [illegible] aëris sese subducturam videretur, sic ut observ[illegible] lucis vestigio conjicerent totam in umbram [illegible] tam Lunam, ut quae latebat antea, sed ipsum [illegible] tectum, sic ut non videre tantum, sed [illegible] interpretamento relinquitur in incerto, [illegible] quo infra ex latitudinis observatione pronuncia[illegible]

Ultimus observatorum accedat Gulielmus [illegible] coelestes ex Tychonis restitutione fixarum [illegible] [illegible] ex [illegible] fuit. [illegible] [illegible] phases 14, cum [illegible] Hollandia [illegible]. In primo 17 [illegible], alt[illegible] 15. 51, [illegible] igitur initium h. 15. 49 [illegible]

[illegible]

[illegible]

[illegible] ☽	11. 10	
	58. 40	— 15. 070
Lat.	[illegible]. 41	— [illegible]

[illegible] Totalis est hic, sed pene in ipso contactu.

☽	[illegible]. 20	
[illegible]	[illegible]. 20	— [illegible]
[illegible]	3. 42	— [illegible]
[illegible] d.	[illegible]. 20	— 11. [illegible]

Dim. mora est tantum 8′.

☊ 7° 42′ 11″ ♓

[illegible]

Lat. 28′ 41″, [illegible] 5″.

Horar. ☽	[illegible]	
☉	[illegible]	
☽ a ☉	[illegible]. 23	— 74[illegible]
	23. 56	— [illegible]
		[illegible]

Dim. dur. h. [illegible]. 35

Medium 18. 7. 35 aeq.

Initium 16. 17

Propterea quod ego parvam aequationem post apogaeum [illegible], praevenit [illegible] calculus Tychonicum 4½′ et paulo plus praevenisset, si non ratione obliqui[illegible] Lunae vicissim aliquid adderem.

[illegible] temporis [illegible] est [illegible] 13″ [illegible], ergo [illegible]. [illegible] erit [illegible]. Initium [illegible] 16. 25 [illegible]

[illegible]

Si [illegible] logarithmo parallaxeos canonico:

[illegible]	13459
[illegible]	[illegible]
466606	[illegible]
555753	[illegible] 9967
18′ 17″	[illegible]

In hoc [illegible] log. est proportio sinuum minimorum, [illegible] prop. arcuum quidem sed minimorum, qui ut recta [illegible] considerantur.

Parall. lat. 51, 24

[illegible]

Vera lat. [illegible] 4 sept.

Latus aequatoris [illegible]

Alt. [illegible]

[illegible] sed [illegible]

Nonag. [illegible]

Parall. ☽ [illegible]

„ long. [illegible]

Verus ☽ [illegible]

Hanc etiam Fabriciana observatio [illegible] nos adeo multo [illegible] maior. [illegible] ☽ promovetur minus quam 1°, sunt [illegible] ☉ [illegible] 57′ [illegible]

[illegible]

[illegible] observavit ☽ adfuisse, [illegible] parallaxi long. [illegible] 15' [illegible] ☽ abfuerit a corde ♌ in [illegible] computabo et tempus et parallaxin [illegible]

[illegible]		53001	Latus aeq. [illegible] 10'		
[illegible]		587	Alt. aeq. [illegible] 14'		
47. 34		53168		52592 — [illegible]	
VS. 73. 0			30. [illegible]		0
[illegible]	[illegible] 17 — 14100		23. [illegible]		
35. 26	[illegible] 48 — 151354		[illegible]		
	[illegible]			39040 — [illegible]	
	112286				1081
[illegible] 33½ — [illegible] 46½	56143		29. [illegible] 40 — 13552		82312

AR. [illegible] 35½ | Nonag. 0. 40½ [illegible]
AR. M. [illegible] 10 | ☽ [illegible] 0. 20 [illegible] | Parall. lat. [illegible] 25".
Diff. 0. 20½.

Cum ergo ☽ sit in ipsissimo Nonag. cum parall. long. nulla, [illegible] visa [illegible] ejus a corde ♌, quae fuit 6°, eadem est cum vera distantia.

[illegible] 12', [illegible] 27', erat igitur A. R. [illegible] 247° 27' [illegible]

Dist. centrorum erat 50' 40" — [illegible] Respondet igitur longitudini 40' 3" 34. 0 — [illegible] vel 5' c. minus.

Locus ☋ [illegible] 27 [illegible] Lat. ☽ [illegible]

[illegible] ♌ [illegible]

[illegible] Tycho in 25° 15' [illegible]

[illegible] medium [illegible] ☽ et extra vigorem oppositionis, quare [illegible] inter- [illegible] 19' subtrahendum: ita est ♌ [illegible]

[illegible] 1598 [illegible]

[illegible]

requirat lector in Optica fol. 302, ubi ipse [illegible]
in prolegomenis. Eplumis ejus mentionem, [illegible]
[illegible] fol. 42. Visa est apicem egredi h. 10. 41' [illegible]
h. 9, ubi tempus [illegible] idem est, [illegible]
vitiose indicata fuit [illegible], nam Wendelburgius [illegible]
[illegible] adjicere jubet. Occidit ea die ⊙ h. 7. 1' [illegible]
et h. 7. 37' [illegible]

Calculus Tychonicus, cui aeq. temp. [illegible]

1597. Aug. d. 5. h. 7. [illegible] ⊙ 23° 20' [illegible] ☽ [illegible]
Med. Lat. 11. 25. 24. 55. [illegible] 25' 49''.

[illegible]

XXIII. Eclipsis Lunae anno 159[illegible].

[illegible] observata est in pago Longimontano, qui uno milliari [illegible] a [illegible], promontorio chersonesi Cimbricae, quod est [illegible] versum oceano Germa-[illegible] [illegible], ubi alt. poli 56° 4[illegible]′. Distantia ab Uraniburgo [illegible] 40 [illegible], quia 10 milliaria sunt Viburgum usque. Quodsi mill. 15 [illegible] 1° circuli magni, sub hoc parallelo igitur 40 milliaria faciunt differentiam meridd. in tempore 19′. At sane mappae ostendunt 18′.

Verba observatoris Severini sunt ista: Deprehendi ex stellis tum meridianum transeuntibus, tum in eodem verticali constitutis eodem tempore (quo [illegible] fuit utendum, cum instrumentis destituerer) deprehendi, inquam, principium [illegible] hujus h. 3. 28′ vel 30′ adeoque ex diligenti animadversione tum aliarum [illegible], tum praecipue ingressus ac primi exitus ex umbra, medium h. [illegible]. 30′ vel potius quasi 3′ ante. Ergo dimidia duratio h. 1. 59′, et emersionis initium h. 7. 29′, cum tamen Sol oriatur h. 7. 32′, ut verear, ne emersio nequiverit animadverti.

At Tycho Brahe tunc Witebergam usque venerat. Ibi altitudo poli 51° 52½′. [illegible] eclipsis fuit in altitud. capitis [illegible] 29° [illegible]′, [illegible] ☽ 29° 43′. Ex utraque altitudine colligitur h. 15. 54′, sed fuit tunc aliqua [illegible] quantitas, ut ita 2′ ante censeatur incepisse. Altitudine Aquilae [illegible] [illegible] est h. 17. 9′ tota Luna visa est in umbra et inferior ejus pars lucidior [illegible] igitur incipientis [illegible] 57′. Plura [illegible], [illegible] quibus etiam Fabricius se excusavit. Sed [illegible] dif-[illegible] Longimontii et Witebergae 24′ [illegible] esset differentia Uraniburgi [illegible] orientalioris 6′ ex supra allegata [illegible] Daniae, quod [illegible] quam chorographica Germaniae tabula [illegible] [illegible] Longimontanae.

[illegible] eclipsin et Krabbus observavit Gröningae 7 milliaribus a [illegible]. Igitur altitudo poli [illegible] 52° [illegible]′, [illegible] per Rostochium et vicinarum urbium [illegible] in occidentem. Initium notatur [illegible] Spica [illegible] cordis ♌ [illegible] 16. 37′, hic [illegible] observationem [illegible] Witeberga habitam [illegible], ita haec [illegible] nullius [illegible].

[illegible] fol. 2[illegible] indicavi, princi-[illegible] cujus hora 16. Jupiter circiter [illegible], nondum tamen sub [illegible]

Calculus Tychonis, cui aequatio [illegible]

☉ 21° 12′ 4″ ♒; ☽ [illegible] 12. 40 ♌; anom. 11s [illegible]

Medium computatur 1¼′ ante h. 16. aequalem.

Tempus incidentiae 1. 15. 29

[illegible] igitur h. 15. 54′ 15″ aequali, [illegible] h. 15. 44. 40 apparenti Uraniburgi [illegible] et Wittebergae loco ex [illegible] ; [illegible] observationem, quia [illegible] in aliis eclipsibus majorem [illegible].

[illegible]

☉ A. R. [illegible]
h. 16. 28. 24. 30

2674	23581	— 47′ 54″ latitudo.
11565 — 03° 2′ 20″		
28. 31. 30		
160 — 58. 34		
55669 — 19907		
34657 — . . . , — 45.		
	111907	(3. 18 dat 0. 48 [illegible])

[illegible] deficiebat semissis circumferentiae [illegible], [illegible] defectus [illegible] flexus, quam proxime igitur deficiebat [illegible], et centrum [illegible] centri umbrae fuit fere una semidiametro [illegible], [illegible] latitudo parva [illegible] igitur centrum si collocès [illegible], veniet [illegible] sane [illegible] est in 21° 8′ = calculo Tychonis; ut [illegible] etiam hac vice [illegible] 6 sc. promovendas, ne cogamur [illegible], quam [illegible] superavit [illegible], nimium statuere.

[illegible] certiora pollicetur phasis altera, [illegible] fuit [illegible].

Vera igitur apparitio h. 9. 51′ 30″ [illegible]

☉	Ann. h.		
1616	17. 5. 19 — 5. 14. 29	[illegible]	
Nov.	22. 6. 30 — 12. 5. 11	[illegible]	

[illegible]. [illegible] Lunae anno [illegible]

[illegible] eclipses [illegible] quas Tycho Brahe [illegible] post [illegible] Progymnas. [illegible] diutius vir ille [illegible] 1601 [illegible]. Nam quae in [illegible] obscuro et ningido non potuit observari [illegible]

Hujus vero [illegible] observatio [illegible] fol. [illegible]. Initium h. 5. [illegible], finis h. 8. 35′, medium [illegible] [illegible] fol. 131 [illegible] [illegible] paulo [illegible] visus est. Hora [illegible] 7. 54½′ [illegible] plus dimidio phasis [illegible]

Krabbus [illegible] principium visum [illegible] medium [illegible] h. 6. 49′, ex alt. oculi ♉ [illegible] tabula 15.

[illegible] Biturigum principium est visum h. [illegible] Diff. [illegible] ejus loci et [illegible] h. 1. 6. [illegible] [illegible] mathematicus Ga[illegible], Tycho Pragae [illegible] Observator fuit Arminius [illegible], [illegible]

[illegible] Tychonis, cui [illegible] T. 4′ 15″ [illegible]

[illegible]

Vera igitur [illegible] h. [illegible]

[illegible]

[illegible] quod minus in defectu fuerit observatum [illegible] et tamen duratio fuit annotata longior; quae [illegible] contradicere [illegible] [illegible] bona parte minuamus, quod tamen non concedi potest. [illegible] [illegible] opticas, quas explicavi, [illegible] observationes ista, [illegible] Nam in aestimando principio et fine [illegible] [illegible] citius incipere, tardius desinere visa est, hinc longiuscula [illegible]

Quod vero quantitatem defectus attinet, videndum jam erit, [illegible] [illegible] observationes. Etenim spatio h. 1. 46½′, [illegible] de motu ☽ a ☉ [illegible] 1° 3′ 54″, de motu vero 1° 8′ 20″, ac proinde mutatio [illegible] 6′ 18″, [illegible], inquam, temporis spatio phasis Lunae deficientis [illegible] mutata est in erectam. [illegible] verticalis per centrum umbrae secuisset umbram eodem in loco ad [illegible] Luna quadrantem confecisset de circulo umbrae, et si tunc [illegible] pars in umbra fuisset, tam umbrae ipsius, quam latitudinis [illegible] At quia et verticalis mutavit et Luna profundius in umbram erat [illegible] major igitur nobis opera nascitur inquirendi tam Nonagesimos, quam [illegible] quamvis hac vice parallaxes tractandae non sint. Horae erant [illegible] 7. 54.

[illegible] angulus verticalis et ecliptica ex tempore.

[illegible] 17. [illegible] 45 | H. 17. 7′ 0″
7. 54
H. 1. 1. 0
[illegible] Log. compl. [illegible] | [illegible] Log. [illegible]
[illegible] 17. [illegible]
[illegible] 55. 59. — Log. 15430 | 48. [illegible] | 25060
29330 | 9361
[illegible] 58. 17 — Log. 22117 | 47. 41 | 39567
[illegible] 49. 11 — Log. logist. 19900 | 19900
38′ 6″ — 59467
Lat. [illegible] in circulo umbrae ex compl. anguli verticalis.
38. 25 — [illegible] 42017

[illegible] exactissime repraesentari [illegible] latitudinis Lunae, si [illegible] Lunae [illegible] in ipso circulo [illegible] quia in posteriori [illegible] a puncto igitur [illegible] puncto fit numeratio [illegible] arcus [illegible] resectus est [illegible] in longitudine [illegible]

[illegible] Parall. [illegible]

ergo semissis [illegible] 1″ [illegible]

[illegible] idem [illegible]

nosciemus aliquid, gratulemur igitur [illegible] loco suo. Vide similia in XXVII. [illegible]

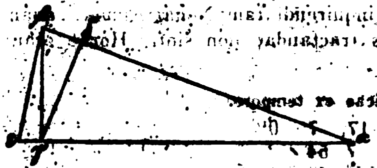
Contuli etiam hanc eclipsin ad fixas. [illegible]

Etenim 11' postquam caput Andromedae in [illegible] Tauri secabat circum Lunae meridianum ita, ut [illegible] verticis, et in meridie respectu cornuum inclinationis [illegible] trione, quod erat verum cum [illegible]

A. R. stellae	[illegible]	0
Mutatio	[illegible]	2. 45
A. R. M. C.	[illegible]	45
A. R. Solis	255.	44
	103.	[illegible]

Fuit igitur [illegible] Horaria [illegible] [illegible]

Fig. 7.



quia a [illegible] est in consequentia, additum [illegible] locum [illegible] 17. 48. 10 [illegible] [illegible]

Asc. obl. horizontis	[illegible]	
Alt. aequatoris	38. 54	41403
	80. 45	
	26. 31½	
	[illegible]	
Ad summam	[illegible]	

Lat. [illegible]

[illegible] puncto fit numeratio [illegible] correctus est.

[illegible]

[illegible] [illegible] [illegible] loco eclipsis. Tale quid etiam post annos 18 in eclipsi anni [illegible], quae [illegible] in eodem signo, deprehensum a me fuit.

XXV. Eclipsis Lunae anno 1602 $\frac{25. \text{Maji}}{4. \text{Junii}}$

Extat observatio mea qualiscunque Pragae habita Astr. parte Optica fol. 359. Etsi enim horologium Tychonicum accommodavi ad altitudinem Solis 4° 40′, quae dat h. 7. 24′, quando monstrabatur h. 6. 43′, incertus tamen sum, annon intermedio tempore steterit, ut solebat interdum. Cum autem centrum Solis occidat eo die h. 7. [illegible] sine refractione, supremus vero Solis margo tardius circiter 2′, rursum [illegible] tardius ob refractionem aliis 4′: ita h. 8. 4′ circiter vestigium iridis duravit [illegible] ad Tychonicam h. 7. 0′, etsi Sol mihi post montem erat: simul nubes colore [illegible] [illegible] prodebant. Tunc crassae nubes conspectum Lunae orientis pro[illegible], praesertim cum immersa tenebris nullo luminis fulgore sibi ipsi ad[illegible]. Intra minutum sonuit urbicum horologium horam 24. Inde hora [illegible] 2′, ut esset vere h. 9. 6′, cum primum ex nubibus aliquod Lunae [illegible] et post 11′, sc. h. 9. 17′ de rotunda Lunae circumferentia sexta [illegible] spectabat. Post 6′ nondum omnis [illegible], sc. h. 9. 23′, at circum[illegible] omnis visa post 2′, h. 9. 25′. Umbra spectabat infra Jovem. Exiit igitur [illegible] latitudine australi vera.

[illegible] Calculus Tychonis, cui aeq. temp. [illegible] subt.

[illegible] II. ☽ 13. 44. 16 ♐ [illegible] 27. 10 [illegible] — [illegible] 20. 17 [illegible] 4

[illegible]	Horar. ☽ 27. 38	Semid. umbrae 43. 16		5. 13
[illegible]	55. 18	Variatio	8	[illegible] 27. Lat. 3′ 43″
[illegible]	59. 18	[illegible]	43. 18	[illegible]
[illegible]	4. 0	☽ [illegible]	16. 10	00. 065
Dimidia duratio	h. 2. 8′ 30″	Summa	59. 28	14. 930
Medium	h. 7. 0. 0	Sc. def.	59. 18	14. 865

[illegible] h. 9. 8. 30 aequali tempore.

[illegible]	5. 24
	9. 14. 0 apparenti.
[illegible]	9. 19. 0 Pragae. Observatio dat h. 9. 25′.

[illegible] in [illegible] Jovem spectans [illegible]. Nam [illegible] Jupiter habuit latitudinem [illegible] [illegible] latitudinem [illegible] tamen sensibile neque [illegible]. Non igitur in ecliptica, sed in austro desiit.

Calculus [illegible].

[illegible]

Aequatio temporis physica mihi est 10′ 40″, [illegible] Uraniburgi, et Pragae h. 9. 30′ 40″. Tantum [illegible] Et quia a medio ad finem sunt 59′ 33″, abest vero ☽ a ♌ [illegible] igitur latitudo adhuc australis fuit, quod congruit observat[illegible] sto cum latitudine, quam Tychonicus.

XXVI. Eclipsis Lunae anno 1603 [illegible]

Diligenter est observata Pragae exstatque [illegible] Opt. fol. 361, sed et aliis locis est observata.

	Initium
Mihi Pragae	h. 10. [illegible]
Mario Patavii	„ 11. [illegible]
Maestlino Tubing.	„ 10. [illegible]
Frid. Rittelio Stuccard.	„ 10. [illegible]

Krabbo in Alteraliam. 12 milliaribus [illegible] a Wolfeb. in occidentem [illegible] 10. [illegible]

Hydrae altit. 32°, Spicae alt. 2[illegible] in [illegible] visum Praga orientalius per 15′, Tubinga [illegible] per 11′. Et quia 12 milliaria sub hoc parallelo [illegible] bntela occidentalior Praga per 5′, eclipsis XXIV. [illegible] occidentaliorem facit.

Potest et finis Krabbo objici, ut intelligatur [illegible] tiae. Nam quomodo duratio ipsi visa [illegible] igitur cervicem ♌ pro spica habuit in [illegible] latente.

Dignum observatu fuit, 10′ ante [illegible] initium [illegible] umbram appropinquantem, et 10′ [illegible] ☽ a me animadversam ex defectu [illegible] initium, quam ego. Reliqua [illegible]

Calculus Tychonis, [illegible]

☉ 3. 18. 28 ♊. ☽ 3. 7. 24 ♐. [illegible]

Horarius 30′ 12″ [illegible]

Umbra com. 44′ 24″ [illegible]

Semid. ☽ [illegible]

[illegible]

	46. 35		Med. h. 12. 13	
Semid. ☽	15. 36		d. dur. 1. 33. 50	
Summa	62. 11	— 16. 360	13. 46. 50.	Uranib. aequali tempore,
Lat.	23. 57	— 06. 420	15. 33.	Physica temporis aequatio subt.,
Se. dim. dur.	48. 29	— 09. 940	Pro Praga 5	hic add.
Horarius ☽	33. 24		14. 7. 23	Pragae appar.
☉	2. 24		Medium 12. 33. 33	
☽ a ☉	31. 0	— 66000		Uterque calculus proximum observationi tenet.
Resid.	17. 29	— 123300		
[illegible] dur. h. 1. 33′ 50″.		— 57300		

Quantitas quanta fuerit, neglexi annotare, sed sperabam posse de ea judicium fieri ex [illegible]. Nam in principio declinabat umbra ab infra ad ortum $45\frac{1}{2}$°; in fine ad [illegible] 32° vel 30°. Computavi vero ad haec momenta:

Nonag.	14° 6′ ♎		1. 30 ♑	
Centrum umbrae	3. 6 ♐		3. 45 ♐	
Distantia	49. 0	log. 28142	27. 47 —	log. 76330
Dist. Nonag. a vertice	62. 20	Mesolog. 64575	73. 37	Mesolog. 122418
[illegible] cum ecliptica	68. 25	— 92717	82. 7	— 198748

[illegible] ergo secavit umbram superius, initio versus occasum, fine versus ortum.

[illegible]	68° 25′	82
[illegible] diacentrum	45. 30	32. 0
[illegible] cum diacentro	22. 55	50. 0 vel 52.

[illegible] semidd. 62′ 11″ vel 1° 2′ 11″.

Hinc latera triangulorum.

[illegible] 22″. Long. 55′ 16″. Lat. 45′ 57″ vel 47′ 17″. Long. 33′ 34″ vel 36′ 57″.

[illegible] 46.	1. 50	1. 31	1. 34	1. 17	1. 12
[illegible] 5	12	10	10	8	8
[illegible]	57. 18	47. 32 —	49. 1	30. 50 —	33. 18

[illegible] omnino vitium esse in his inclinationibus. Nam et latitudinis [illegible] a finali prodit nimia differentia et horarius prodit nimius.

[illegible] pulchra quaedam et artificiosa problemata texere, quae datis quarumcunque phasium inclinationibus, terminorum [illegible] tam durationis quam [illegible] vel [illegible] ☽ vel horario, reliqua omnia sumerent demonstranda. [illegible] lubricum esse negotium observandi inclinationes in Luna exacte et [illegible] errore magnam ruinam sequi. Praeterea [illegible] est semidiametrum [illegible] alia permittere aleae tam periculosae [illegible] maxima, [illegible] *[illegible]* postquam plurimum [illegible]

[illegible] quantitate [illegible] visi [illegible] latitudine ☽ vera [illegible]. Cum enim detur horarius ex hypothesi, [illegible], semi- [illegible] a priori, et [illegible] observatione: facile datur et arcus [illegible] ☽ [illegible] 62′ 11″. Antil. 16. 360.

[illegible]

diametri, eoque sexta pars diametri ☽ seu 5′ 11″ ... metrum, ut esset distantia centrorum 31′ 48″, ... 31′ 31″ prodit latitudo in medio 41′ 0″, fere ... finali observatione inclinationis ut certiori, fuit ...

Consideretur tamen etiam evidentissima inclinatio, ... medio. Ergo h. 12. 25′ Luna stabat cernua, demissis ... in meridiano 9° ♐. Angulus meridiani cum ecl. 81° ... recta desuper inclinabat ad ortum 9° c. Nec multo aliter ... et ea quae in centrum Lunae recta, ad eclipticam ... centrum habuit in verticali, ergo ad occidentem, ... At h. 12. 44′ jam occidentalius cornu ... erat et in ipso medio et post medium. Quia tamen ... additum enim est observationi nonnihil, hinc ... liter claras inclinationum fidem in dubium vocare. ... infra sequentur.

Observata est Luna et ad fixas.

Hora 10. 38′, 11′ antequam culminaret Jupiter, ... in eodem praecise verticali cum corde ♏, a quo ... parallaxin toto durationis tempore recessit iterum ... paruit h. 12. 13′, quando Luna nondum recta ... cornibus, velut ex obliquo versus sinistram. Et h. 12. ... adhuc occidentaliorem fuisse corde ♏ ...

. Ergo A.R. ☉ 61. 2. Luna h. 1. 30′ ...
Hora 10. 38′ + 159. 30 ... Lat. ...

Asc. obl. horosc. 310. 32
Latus aequat. 49. 28 Log. 27440 ...
Alt. aequator. 40. 54 „ 44462 ...

...

Parall. ☽ 62. 11 ...

[illegible] rei fidem [illegible] [illegible] 18° [illegible] [illegible] medium eclipsis, quando [illegible] ☽ [illegible] 8° 6′ 15″, [illegible] ad eclipticam [illegible] 4′ [illegible] ♐, [illegible] lat. [illegible]
[illegible] 336° 47′
[illegible] 23. 13. — 93067.
Alt. [illegible] 39. 54 44402 — [illegible]
137489 — 8304
52. [illegible] — 28201
[illegible] 21½
75. [illegible] 3623
106493 — 6027 Mesol. 100116
47. 11 — — 30936 [illegible]
Non.) 12. 49 ♏ 400027 Par. lat. 57′ 0″
[illegible] ☽ 2. 4½ ♐ 44. 35
Distantia 20. 15⅔ 105940 Corr. Visa lat. 0. 13. 25
408900 [illegible]
[illegible] 7′ 45″ — 616933 Ang. [illegible] — 205466. Est adhuc ☽ in
[illegible] ☽ 8° 44′ 32″ ♐ [illegible] 4. 27. 0 quadr. orient.
0. [illegible] 40 231600 4. 11. 35 [illegible]
8. 44. 12 ♐ 466950
828
466122 (log. 82′ 40″)

[illegible] locum referretur cor ♏, si ☽ in illius verticali fuisset. Refertur ergo [illegible], et quidem plus quam semidiametro ☽; ergo ultra 4° 2′ ♐. Nam si [illegible] [illegible] fuisset, hoc ego procul dubio notassem.

[illegible] eclipsis fuit angulus inter eclipticam et verticalem, [illegible] supra [illegible], 82° 7′ [illegible] facilis. A.R. ⊙ 61° 8′, h. [illegible] A.R. med. coeli [illegible] ♉ [illegible] et Nonag. paulo [illegible] [illegible] 20′, quanta potest maxime.

[illegible] parall. lat. secundum hanc [illegible]
4036
414759 — 0° 54′ 20″. Lat. [illegible]

[illegible]

Calculus Tychonis, cui aeq. [illegible]

☉ 25. 57. 46 ♏. ☽ 25. 54. 36. [illegible] Anom. [illegible]

Plena ☍ h. 7. 6 Horar ☽ 29. [illegible]

Aeq. T. 9. 21 Semid. ☽ [illegible]

Pro Praga 5. [illegible] cor. [illegible]

h. 7. 20. 21 Pragae temp. app. Summa [illegible] — 14. [illegible]

[illegible] 49. 47 — 10. [illegible]

Sc. defectus 8. 26 [illegible]

Sc. dim. dim. 30. 11 [illegible]

[illegible] h. 1. [illegible]

[illegible]

1603. ☉ [illegible] ☽

Jun. 17. h. 17. 47 — 5. 46. 32 25. 2. 34. [illegible]

Nov. 8. 7. 19. 37. 37 Oct/311. [illegible]

143. 13. 13 [illegible] 336. 9. 24 [illegible]

☉ 25. 57. 27 ♏. Rev. [illegible] 42 [illegible]

Parall. ☽ 60. 8 [illegible] 17. 41. [illegible]

„ ☉ 1. [illegible]

61. 9

Semid. ☉ 15. 30

umbrae 45. 39

☽ 15. [illegible]

Summa 61. 7 — 15. 800

Lat. 51. 5 — 11. 070

[illegible] 10. 2 [illegible]

Sc. dim. [illegible] 32. [illegible] — 34. 330 [illegible]

Horar. ☽ 32. 34

„ ☉ 2. 32 Duratio h. 1. 8. 48″ [illegible]

☽ a ☉ 30. 2.

Non assequor 12″ [illegible]

temporis physica. [illegible]

quia minorem aequ[illegible]

nisi [illegible] ad [illegible]

[illegible]

latit[illegible]

[illegible]

Datur [illegible]

incerta est [illegible]

in extremis [illegible]

[illegible]

Log. 72059.
[illegible]
Mes. 61700 Ang. 28. 21
61. 39
5. 18
[illegible]. 57
[illegible]. 16
[illegible]. 41.

Summa semidd. 61′ 7″ = [illegible]
28. 1 [illegible]
Latit. 53′ 46″ 12. 240. Ecce [illegible].

Nam si Luna accipiat scrupula durationis ex observatione et horario ☽ a ☉, [illegible] [illegible] sane major, quam si finis eclipsationis in ipso vertice ponatur, [illegible] oportet declinaverit a vertice Lunaris disci ad sinistram. Haec enim lati[illegible] 53′ 46″ competet ipsi medio facietque angulos 28° 21′ et 61° 39′, si rectus [illegible] ad orbitam Lunae, sed ipsius orbitae ad eclipticam inclinatio addet alios [illegible]° 18′, ut sic linea per centra cum verticali formet angulum 6° 41′. Consentiunt [illegible] inclinatio finalis, duratio et quantitas ad latitudinem calculi [illegible] [illegible] ☋ nodi.

XXVIII. Eclipsis Lunae anno 1605. $\frac{24.\ Mart.}{3.\ Apr.}$

[illegible] David Fabricius observavit sub meridiano civitatis Emdensis in pago [illegible] alt. poli 53° 39′. Initium ex altitudine Sirii 17° [illegible] h. 7. 16′. [illegible] Arcturi 46° 25′ h. 10. 31′. Duratio igitur h. 3. 15′ et medium [illegible].

[illegible], inquit, lucis particula (in media duratione) aestimative digitum [illegible] [illegible] difficile fuit internoscere. [illegible] Lunae [illegible] instrumento pro[illegible] cornua erecta stare viderentur, altitudo Sirii fuit ipsi 13° 35′. [illegible] Tubingae initium [illegible] alt. Arct. 48° 12′ i. e. h. 7. 29′ 30″, [illegible] 30″ [illegible], ubi duratio h. [illegible]. Confirmat [illegible] Rissalius. Ergo medium h. 9. [illegible] (Libello de [illegible] fol. 89.) Differ. meridd. 7′ fere ut in eclipsi XXI. [illegible] Defectum [illegible] 11. 30′; addit quidem „ex observatione,“ sed [illegible] etiam „ex [illegible] inclinationes, tempora [illegible] observatio, ut [illegible]

Calculus Tychonis,

⊙ 14. 10. 46 ♈. ☽ 14. 12. 20 ♎. Anom. 5. 2.
Ante 3' . . . ☊. Horarius 34' 51"
Semid. umbrae 46. 10
☽ 17. 32
Summa 64. 2
Sc. dim. dur. 57
Resid.

Ita haec eclipsis ex calculo Tychonis valde propinquat observationi temporis et durationis et quantitatis.

1605. ⊙ 1604. ☽
Jan. 17. 6. 16 — 5. 28. 39 ♋. Febr. 12.
Mart. 24. 9. 7 — 20. 25. 13 D. 22.
84. 21. 9 51. 46
58. 50 ⊙ 14. 11. 27 ♈
1960
12806

Parall. ☽ Exc. ☽
⊙ 1.
64. 22 ☽ a ⊙ 35. 33 — 52347

tempus

31. 43

[illegible] rationem [illegible] quantitatem, promoveri. [illegible] hic [illegible] ad [illegible] conditionem [illegible] quid enim etiam in XXIV. a. 1604. [illegible]

XXIX. Eclipsis Lunae anno 1605. 16/26. Sept.

Fabricius ad urbem Emden Frisiae, cum c. 2′ deficerent, altitudinem (Sirii) invenit 8° 20′, unde habetur h. 14. 55′, ut initium fuerit h. 14. 51′, Maestlinus Tubingae inter nubes idem initium, quantum dabatur, signavit altitudine ejusdem [illegible], inde h. 15. 6′ et differentia merid. 15′, multo plus quam in antecedenti. Tabulae dant 9. Etsi in disputatione de irregularitatibus (Maestlini) fol. 75. [illegible] exprimitur h. 15. 34′. Occidit Luna lumine nondum repleta, ergo duratio [illegible] h. 2. 46′. Pragae quidem serenum non fuit.

[illegible] Stuccardiae et indice hoc Marius Hailbronnae, Krabbusque Wolfenbuttelae consentiunt, quod mireris, in eandem absurdam observationem, quam ut [illegible] omitto, majoris facio dictorum mathematicorum annotationes, de quibus mihi certius constat. Et Krabbus altitudine Hirci usus est 70° [illegible]. [illegible] et [illegible] eclipseos annotavit h. 17. 38′ in altitudine ☽ [illegible]°, cum eo die Sol [illegible] h. 17. 32′, refractio maturius; atqui orto jam Sole Lunam in tanta ad horizontem propinquitate, coelo nubilo, videre et simul discernere, an exacte [illegible] [illegible] res est negotii. Et Maestlino occidentaliori occidit Luna [illegible] repleta.

Calculus Tychonis, cui aeq. temp. 1′ 18″ sub.

[illegible] ♎ [illegible] ☽ 3. 58. 20 ♈ anom. 10. 2. 57. 42. Mot. lat. 5. 23. [illegible]

[illegible] h. 16. 37 Horar. 28. 40 [illegible] 5. 10

[illegible] 1. 38. 47 Semid. umbrae 43. 13 [illegible] 2. 35

[illegible] 14. 58. 13 aequali ☽ 16. 28 [illegible] 12

[illegible] 1. 18 hic add. Summa semid. 59. 41 — 14. 000 36. 19

[illegible] Sub. Lat. 33. 12 [illegible] Latit. 33. 12

[illegible] 14. 48. 31 [illegible] appar. Se. dimet. 26. 29

[illegible] 9. Se. dim. [illegible] 47. 12 — [illegible]

[illegible] 14. 39. 31 Emdae. [illegible] 18. 32 [illegible]

Dim. dur. h. 1. 38. 47

[illegible] observatione, tempus [illegible]

Calculo [illegible]

☽ 1604. [illegible]

[illegible] Aug. 12. 3. 2. 17 [illegible]

[illegible] D. 15. 258. 16. 44. [illegible]

[illegible]

[illegible] 35. 29

[illegible] 10. 5. 29

[illegible] 15. 1

[illegible]

Tardior est calculus meus Tychonico, ... hoc igitur et cum aequatione temporis physica ... aberramus vero uterque ab observatione. (Nota: Eclipsis ...

XXX. Eclipsis Lunae anno 160[illegible].

Pragae per nubes properatis occasionibus ... culminavit Luna; quae cum fuerit ante ☍ ☉ ... h. 12. 7'. quam correctionem horologii observ...

Hora arcis 13. index horologii mei domestici ... minuto 37. cum Jupiter in azimutho 37° instrumenti ... instrumenti staret in meridie, jam 4 in vero azimutho ... peram additum, tunc illum culminasse ... hora tantum 13. 30' prodiret, cum sit 13. 4...

Hora arcis 14. rursum index meus erat in ... secundum culminationem Lunae h. 14. 30', ... Post 3' jam agnosci potuit aliquis defectus, ...

Post alia 20' quarta circumferentiae ... oculi Tauri 45° 37', quadrante collocato in azimutho ... instrumenti, cujus tamen initium non erat in ... drantis. Itaque inter meridianum et verticalem ...

Paulo post hora arcis 15. in ... quadrantem arcis 57'. Ita vides ...

Ex altitudine oculi ♉ ...

VP 39° 54' ...

PS 74. 1...

[illegible]

Calculo meo sic.

☽ 1606.

Jul. 25. 16. 52. 9 — 3. 30. 57. 18 — 5. 48. 45. 43

D. 25. 267. 15. 26.

263. 8. 27. 9

Rev. X 275. 13. 5. 49 — 1. 0. 41. 57 — 0. 14. 35. 29

12. 4. 38. 40 — 4. 21. 37. 15 — 5. 2. 10. 14

Aug. 26. 15. 28 — 6. 6. 49

66. 20. 43 — 50. 21

56. 20. ⊙ 12. 47. 54

14710

2947

17557

Parall. ☽ 63. 30

⊙ 1. 0

64. 29

Semid. ⊙ 15. 9

Umbrae 49. 20

☽ 16. 18

Summa 65. 38 — 18. 280

Diff. 32. 58 — 11. 780

Ergo 1. 15. 18½

Initium 14. 13 aequali.

Lat. 52. 48

Simpl. 50. 58

... dim. 39. 3 — 06. 450. Horarius ☽ 33. 12; ⊙ 2. 28; ☽ a ⊙ 35. 44 — 51890

Dimidium dur. 1. [illegible] Resid. 3. 19 — [illegible]

Praevenio Tychonicum et observationem 12′, et quia [illegible] aliquid [illegible] et quia [illegible] adde. At aequatio physica 17′ 43″ addi, hic subtr., quamvis plane [illegible] aequatio physica. — Probetur etiam [illegible] inclinationis cum [illegible].

⊙ 18. 3. Sit AR. M. C. 29. 9. Ergo asc. obliqua horoscopi 119°.

[illegible] 61° 0′ — 18397

44402 — 26505

57799 — 18040

Initium [illegible]

Praeterea ⊙ [illegible] ... perfecta [illegible]. Ergo tamen duratione [illegible] propius experientia [illegible] — Initium 27° 30′.

[illegible]

sciioterici. Verum haec inter se multum [illegible]
h. 15. 38', scilicet ipsa Spica in meridiano [illegible]
itaque parvus error in altitudine multum efficit [illegible]
h. 13. 8' et duratio h. 3. 16', medium h. 14. [illegible]

Calculus Tychonis, cui acc. temp. [illegible]

[illegible]

Pro diff. merid. 10' ex fide tab.

Summa 60. 7

Latit. 30. 23

Sc. dim. dim.

Dim. duratio h. 1. 44.

Calculo meo sic:

[illegible]

Parall. ☽ 60.

» ☉ 1. 1

Semid. ☉ 15.

» umbr.

[illegible]

alia 32', sc. h. 13. 42' finis visus. Propinquitatem tamen umbrae sensi per 26' deinceps. Tempus igitur emersionis h. 1. 5'.

[illegible] Wolfenbuttelae notavit initio altitudinem Aquilae 41°; quae arguit h. 10. 25', ipse tamen apposuit horam 10. 26', fine altitudinem [illegible] 51°, quae dat h. 12. 48', cum ipse apponat h. 12. 56' et [illegible] h. 3. 44', cum extrema in horologio includant h. 3. 24'. In descriptione colorum disertus est, rubram apparitione dictitans et fuscam, in circumferentia gilvam et in [illegible].

Rittelius [illegible] initium morae prodidit h. 10. 45', finem morae h. 12. 41', ergo med. h. 11. 43' ex altitudinibus Aquilae. Quod si Krabbius h. 12. 48' vidisset finem solius morae, non totius eclipsis, differentia meridd. esset 7'. At quia mihi finis morae h. 12. 36' Pragae vel etiam ante, hinc dubitandi mihi causa est, an [illegible] sana sit etiam Ritteliana observatio. Etsi in mea quoque observatione invenio annotatum, videndum, an situs instrumenti tenuerit meridiem. Alias bene conveniunt mea tempora, quod cum coeperit ante h. 12. 36', hinc usque ad h. 13. 10' per 34' emersisse dimidium, hinc rursum per 32 alia minuta reliquum dimidium.

Calculus Tychonis, cui aeq. temp. 7' 40" add.

[illegible] 24. 8. [illegible] ☽ 24. 16. [illegible] Anom. 2. 18. 7. 44; mot. lat. 5. 27. 21. 17

[illegible] 5. 15 Semid. umbrae 44. 18 5. 11

h. 11. 57. 35 Uranib. Summa 51. 6 — 15. 800 3

12. 2. 35 app. Pragae [illegible] 33. 200 15. 36

[illegible] Sc. dur. [illegible] Lat. 15. 47

[illegible] 14. 2. app. Sc. mor. dim. 23. 46 [illegible]

[illegible] Dim. dur. h. 1. 59. 30

mora 0. 47. 34

Emersio 1. 12.

Calculus meo sic.

[illegible] — 5. 52. 30 [illegible] — 6. 13. 50. [illegible] 7. 21. 55

12. 6 — 18. 4. 46

11. 38

[illegible] 10 ⊙ 24. 0. 14 Rev. [illegible] 4 — 0. 21. 28. [illegible] 12. 50

159260 [illegible] — 7. 5. 19. [illegible] 27. 9. 5

4840 32. 31 2. 13. 31 [illegible] 13

154040 61300 [illegible]

[illegible]

XXXIII. Eclipsis Lunae anno 16[illegible]

Pragae obscurae erant noctes et dies [illegible] ut videre est in epistola, quam praefixi [illegible] pora nulla addidit. At Frid. Rittelius Stuccardiae [illegible] Sirii 12° 30′ occid., addidit h. 15. 15′, sed haec [illegible] visus h. 17. 25′ urbis et in sciotherico Solari [illegible]

Marius Onoldsbachii promit principium h. 15. 1[illegible] ergo h. 2. 40′, ergo medium h. 16. 21′, et [illegible] Onoldsbachii 14′. Maginus dant 9′ [illegible]

Calculus Tychonis, sed [illegible]

☉ 8. 26. 52 ♑. ☽ [illegible]

Aequatio temp. 8. 0. Hora 16. 32 ☍ vera. [illegible]

h. 16. 32.

16. 29. appar.

Onoldsb. 16. 27. Marius 16. 21.

Stuttg. 16. 18.

1. 7.

Initium 15. 11. Rittel. 15. 2. [illegible]

Finis 17. 25.

☉ 1611. 17. 10. 42 [illegible]

[illegible] 10. 16. 2[illegible] 19. [illegible] ad finem 1[illegible]

☉ 8. 27. 25 ♑

[illegible]

[illegible] Tychonis, cui aequatio temp. 9' 32'' subt.

☉ 24. [illegible] ♉. ☽ 24. 15. 47 ♏. 6. 23. 9. 54. 5. 22. 10. 19

☽ 17. 8	06. 970		5. 10
[illegible]	— 12. 250		53
[illegible] dup. [illegible]	— 06. 260		41. 29
15. 47		Lat.	40. 36
			61. 58
		Sc. def.	21. 22
		Diim.	10. 41 — 172700
			34. 16 — 56000
		Digiti 7. 28'	116700

Dim. duratio h. 1. 30'. Vera ☍ h. 10. [illegible] 30'', aeq. temp. hic add. 9' 32'',

finis Uranib. h. 12. 5' app.

Stiocardiae „ 11. 54.

Calculus alio sic.

[illegible] 6. 50. [illegible] 10 — 16. 16. 36. 18 — 2. 9. 6. 0

[illegible]

Lat. [illegible]

Diim. dur. h. 1. 21. 30

[illegible] 10. 26.

Finis „ 11. 47. 30

[illegible] 10. 33

Finis „ 12. 6. 3 Uranib. app.

11. 54. Stiocardiae.

[illegible]

[illegible] quasi [illegible]

emergat 6° 16′ ♉, cum lat. [illegible] [illegible]
deinde colligimus horam, ut sequitur: VP 41. [illegible] [illegible]

SP 76. 11
34. 59
SV 79. 37½
44. 38½ [illegible]
114. 36½ — [illegible]

[illegible] differentia [illegible]

89. 58 — 44. [illegible]
33. 56
[illegible]

A.R. M. C. 305. [illegible] ♉ [illegible]
A.R. ⊙ 213. [illegible] 35. [illegible]
[illegible]

David Fabricius in Prognostico ait, finem [illegible] in altitudine Lucidae ♈ 23°. 30′. At in [illegible] adhuc digitus deficeret, ait se finem [illegible] est in stabiliendo gemino defectu Lunae, [illegible] alter in amictu aëris Lunaris, qui [illegible] meridiana fol. 21 [illegible] dogmata [illegible] fortioris lucis diffusiorem in oculo, [illegible] [illegible]tissimi rerum [illegible] Amplect[illegible] [illegible] h. [illegible]. Et [illegible] [illegible] 11′, [illegible] 10. [illegible] finem eclipsis, idem [illegible] perspicilli [illegible] ego, qui cum Fabricio eodem visus vitio [illegible] [illegible] durationem ultra ista [illegible] cum [illegible] potest quantitas [illegible] me [illegible] insidiis expedio, ut finem [illegible]

[illegible]

[illegible] 44. 0 [illegible] Lat. 1. 43
[illegible] 15. 0 [illegible]
[illegible] 0 — 14. 720
[illegible] 0 — 03. 560 [illegible]
Lat. 4. 43 — 00. 100 Medium h. 5. [illegible]
mora dim. 28. 35 — 03. 460 Dim. dur. 2. 3. 15
dur. dim. 55. 47 — 14. 630 Finis 6. 4. 15
Residuum 1. 5. Mora dim. h. 1. 2′ 22″ Aeq. phys. add. hic subt. 2. 24
3. 47 Dur. h. 2. 5. 15. Pro Tubinga 11.
Tubingae 5. 31.
Occasus 5. 41.

Calculi cetera conveniunt, in sola aeq. temp. est diversitas, [illegible] Tycho [illegible] [illegible] aequatio physica.

XXXVI. Eclipsis Lunae anno 1616. 16/26. Augusti.

Descriptio observationum hujus eclipsis exstat in Prolog. Ephem. Maestlinus [illegible] principium prodidit h. 13. 32′, ex alt. [illegible] Orientis 9°. Finem [illegible] alt. [illegible] Ergo duratio h. 3. 10′ et medium h. 15. 8′. [illegible] [illegible] aliquid, ut non esset totalis etiam telescopio usus. (v. Hansch. p. 48.) [illegible] vero nactus Georgius Herwartus observationem ad me transmisit. [illegible] h. [illegible] 13′ 30″ [illegible] h. [illegible] 56′ 24″ [illegible] Constat et hic observatoribus [illegible] [illegible] totalem fuisse. Sed addit aliam observationem in aliis aedibus, [illegible] telescopio momentum incidentiae prodiderunt h. 15. 6′ 30″, [illegible] vero h. 15. 33′ 45″ [illegible] esset in tenebris per 27′ 15″. Medium [illegible] 20′, et duratio h. 3. 12′, [illegible] et Maestlino visum. Ergo differentia [illegible]

[illegible]

Sel jam e regione in azimutho 75° haberet al...
luminare in semicirculo instrumenti meridionali ...
residui alicujus defectus suspicio in occumbente; ...
Luna discernebatur ab aëre circumstante, radiis ...
igitur, an fuerit tantum debilitas luminis ex illa ...

Erat igitur Luna adhuc in austro circiter 2...
erat in austrum, et vicissim refractione rursus ...
occideret. Quin et tertia causa fuit, cur australior ...
quia jam superaverat locum Solis uno fere gradu. ...
potuit refractio utriusque luminaris contrarium ...
plagam declinarent ob oppositione luminaris ...

Non fuit igitur magna refractio. Et quia Sol ...
10° 6' sept. lat. 17...

[illegible]

et hoc numeratum fuit in instrumento 75°. [illegible]

[illegible]

[illegible] PV. 41. 44 — 40087 VPS [illegible]
PS 162. 5 — 1220 PS [illegible]
89. 21 — 44887
VS 65. 0 — VS [illegible]
[illegible] 14. 1. 32. 5. 21 — 2. 40½ — 306460 PVS [illegible]
125. 21 — 62. 40½ — 11832 Alt. ☽ dat h. [illegible]
318292 azimuth [illegible]
276255 [illegible]
VPS 29. 6 — 14. 33 — 138178

[illegible] certior sit observatio per altitudinem, quam per azimuth, quia regulae [illegible] id latus alterutrum: dimitto igitur azimuth 32° 55′, [illegible] 20′, quod in Prolog. Ephem. visum mihi erant ex fixarum altitudinibus [illegible] inquisitum tempus initii, nisi quod ob nubes id [illegible] tardiuscule agnovi. [illegible] fine, cum Sol oriatur h. 17. 14′ fiatque uno gradu altior post 6′, ergo h. 17. 20′, [illegible] mihi duratio h. 3. 24′, si certo in ipso occasu Luna restituta fuisset. At si [illegible] ubi in Prolog. censeam, mihi [illegible] duratio fiet 3. 29′. Ex comparatione igitur obser[illegible] initii differentia Romae et Lincii fiet 12′ vel 12′, Tubingae et Lincii 22′ vel 22′ [illegible] h. 15. 32′, et finis fuerit h. 17. 2′, Uraniburgi medium h. 15. 22′.

Calculus Tychonis, cui aequat. temp. 7′ 37″ add.

[illegible] 4 [illegible]. ☽ 3. 55. 2 ♓. 6. 6. 24. 52. 11. 24. 41. 16
[illegible] 35′ 28″ . . . . 52800 . 5. 11
[illegible] umbrae 46. 00 [illegible]
☽ 17. 59 03. 320 [illegible]
Summa 64. 38 — 17. 670 31. 9
[illegible] 58. 25 — 14. 350 27. 30 lat.
Residua 23. 2 — 95800 63. 38 summa semidd.
[illegible] 37. 2 Sin. def.
[illegible] 1. 33. 1. 65. [illegible] ☽
Totalis sine mora.

Calculus meus sic.

[illegible] 6. 0. 11 ☉ 1618. 4. 3. 48. 20 — 3. 29. 20. 37 — 11. 21. 39. 57
Biss. Jul.
[illegible] — D. [illegible] 15. 36.
[illegible] 29. 2 234. 19. 18. 20
[illegible] 1. 27 Rev. IX. 347. 23. 47. 14 — 0. 37. 37. 46 — 0. 12. 7. 56
[illegible] 12. 4. 27. 54 [illegible] 11. [illegible]

[illegible]

monia M[illegible], alterius Romani, meumque [illegible]
non fuisse totalis: [illegible]rtum inveniet lect[illegible]
mihi diu [illegible]odum et plus quam dimidiam [illegible]
diminuens lumen ulterius neque rursum au[illegible]
in lumine, [illegible] brevis r[illegible] corporis Lunae [illegible]
in oculis meis, ut solent lucida, hoc latitudo [illegible]
cornu ad lineam di[illegible]n, inordinatus et ruber [illegible]
sumatur altitudo Lunae tunc observata, cum hoc [illegible]
sunt ore Pegasi in illo situ paulo superiores [illegible]
os et caput. In prolegomenis [illegible] pro ore [illegible]
erat remotius, sed os. Cum igitur Luna [illegible]
ad sinistram, at vero os Pegasi in 25° [illegible]
transponeretur a sinistra ad dextram, jam [illegible]
quippe versus 27° ♒, proinde conveniebat [illegible]
in consequentia exeat. Quippe in circulo [illegible]
versus unae in palma ♒ [illegible]
fuisset medium corpus. Atqui Lunae [illegible]

Addatur de parallaxi ☽ 53′ 49″ [illegible]
et sit altitudo vera 17° 0′ [illegible]

Est autem Lunae vera longitudo 8° 58′ ♓ [illegible]

ergo A.R. 335° 47′

48. 44

A.R. M. C. 24. 31

A.R. ☉ 155. 48

228. 49. [illegible]

[illegible] vera 10° 44′ [illegible]

[illegible] latitudinem valde [illegible] parum. [illegible] enim [illegible] dimidia [illegible] parum admodum [illegible] ad sinistram. [illegible] ipsa [illegible] congruit cum observata, quare etiam latitudinem calculi ratam esse necesse [illegible] anguli constituantur in hunc modum:

	57′ 41″	— 408800
	1. 5. 54	— 395400
		13400 Ang. 41°.

[illegible] diacentros ad orbitam ☽ inclinabatur angulo 29°, ad eclipticam 34° 18′, [illegible] igitur angulo 14° 44′; hoc illud „parum" est, quo umbra declinavit [illegible] ad sinistram. Nihil igitur inclinatio observata repugnat latitudini calculi [illegible] quantitati hactenus defensae, quin potius hanc confirmat duratio [illegible] in augenda est ista, ut propius ad meam durationem observatam [illegible] multo profundius Luna in umbram mergetur, nodusque sequens ☊ in [illegible] revocabitur, ut jam ante dictum.

XXXVII. Eclipsis Lunae [illegible] 1617. 6/16. Augusti.

[illegible] Fed. [illegible] altitudine Aquilae, sed quae laxum [illegible] temporis, cum stella meridiano propinquet. Et perperam puto [illegible] alt. pro alt. Aquilae. [illegible] igitur hac vice.

[illegible] observatum esse h. 9. 48′ Jo. Remus Quietanus ad me per[illegible] emersus h. 1. 1′. Lincii observavimus illam utcunque. Descriptio [illegible] observationis in Eph. anni 1617. mense Augusto; examen in vestibulo illius [illegible].

[illegible] refractionis [illegible] coelo pluvio, aura penitus aquea. Cum Luna eo die [illegible] Lincii h. 7. 8′ orta [illegible] est, postquam quatuor distincta horologia [illegible] intervallis [illegible] sonuissent h. 7., jam imminente [illegible] in arcis [illegible] est, ut Luna quasi sub longo [illegible] e vapo[illegible] conspiceretur, habens altitudinem supremi [illegible] 1° 36′. De[illegible] Tenebat azimuth instrumenti 24° 32′ [illegible] illud [illegible] sese condidit atrarum nubium. [illegible] h. 8. 45′ [illegible] nubibus emergere, jam initio emer[illegible]. Cum [illegible] horologium sonuisset h. 9., censebantur [illegible] altitudo ☽ erat [illegible]. Cum sonaret insuper qua[illegible] in uno, nondum dimidia [illegible] in altero jam semicircumferentia lucida [illegible] 20′ [illegible] all. ☽ 21 [illegible] in azimutho 52° 50′. H. 9. 45′ [illegible] Alt. 23° +, azimutho 57 +.

[illegible]

Rursum, si ponamus dodrantem [illegible] logium tardissimum ostuit h. 7, vel [illegible] etiam cum idem sonaret h. 9. Ergo [illegible] eclipsis incidit: tardius vero, si corrige[illegible] 10′ indicio horologii. Fuit igitur medium [illegible] isti digiti emerserant per 14′, principium igitur [illegible] medium ergo h. 8. 11′ ut prius fere.

In fine eclipsis, cum notatum [illegible] stabilita 1° 12′, restat justum azimuth [illegible] cum lat. 0° 23′ sept., si nullam [illegible] azimuthum a meridiano 32° 11′ in [illegible] Per parallaxin igitur habuit altitudinem [illegible] non vere 23° 0′. Fieri potest, ut [illegible] clivis est, claudendo se, seu complicando [illegible] fenestra minus impeditus erat ad [illegible] igitur Luna per 32° 11′ abest a meridiano [illegible] vel secundum altitudinem ☽ majorem [illegible] etiam altitudines et azimutha [illegible] addantur horologiis. Ita emersio [illegible] ille observavit. Confirmatur autem [illegible] dicuntur.

Calculus Tychonis, cui adj. [illegible]

☉ 23. 48. 55 ♌. ☽ 23. 39. 10 ≈ 4. 1[illegible]

Post [illegible]

[illegible]

[illegible] medio vix 4′ Tychonicum sequor, 13′ observationem. Sed aequatio [illegible] physica est 19′ 21″ add., hic subtr. Igitur h. 8. 3′ apparenti Urani-[illegible] h. 8. 13′ Lincii fit obscuratio maxima; ita [illegible]. [illegible] emersionem tueor ut est observata.

XXXVIII. Eclipsis Lunae anno 1619. 16/26. Junii.

[illegible] Rittelius Stuccardiae principium observavit, cum in arce et curia oppi-[illegible] sonarent horologia h. 11. 45′, altitudine centri ☽ 18° 30′, qua nihil [illegible], utcunque bona sit, quia Luna vicinissima meridiano.

[illegible] certi nihil observare potuit ob nubila, nisi quod durationem putat [illegible] h. 1. 45′. Erant et Lincii densae nubes, interdum patentes. Hora [illegible] urbis, cum per raras nubeculas pelluceret, nihil deperdidisse putabatur; [illegible] vero discessu nubis in sudo conspecta est, visa est quasi rasa superius, ac [illegible] agnoscebatur deflexio defectus ad sinistram, quasi versus Lyram (puto autem [illegible] versus Aquilam, quia Lyra ex fenestra humili conspici non potuit vertici [illegible] jamque ultra meridianum ad dextram progressa). — Post quadrantem [illegible] rursum enixa e nubibus, praecise sursum vertebat particulam deficientem. [illegible] quidem defectus satis latus fere semidiametrum Lunae a margine et cornu [illegible] occidentali in orientalem; at defectus quantitas nisi infidissime aestimari non [illegible]. Finem nubes et hiems interceperunt. Discedunt horologia ab invicem [illegible] et Lincianum, nam differentia meridd. non est 45′, sed tantum 21′. [illegible] utrique potest adhiberi correctio, additis Stuccardiano 8, ablatis Linciano [illegible], ut initium merum sit h. 12. 14′ Lincii. Et quia umbra in principio h. [illegible] 22′, sic correcte fuit ad sinistram, quando verticalis per Lunam cum ecliptica [illegible] rectum formabat angulum; quanto igitur minus agnoscebatur deflexio ad [illegible], tanto minor et defectus fieri potuit. Et quia ☍ ☉ in 4° 45′ ♑ et [illegible] in 20° ♑, umbra ad illam vergens parum adhuc erat in consequentia. [illegible] quia post horae quadrantem (h. 12. 33′ correcte) defectus stetit in summo, [illegible] quidem medium esse potuit, quia diacentros juncta verticali secabat eclip-[illegible] [illegible], [illegible] Lunae obliquius [illegible] infra eclipticam versus occasum, [illegible]. [illegible] enim ex abundanti hora plane 12. 45′ sine correctione, fiet Asc. oblq. [illegible] 8° 19′ ♉, distabit [illegible] a vertice 71° 40′, a Luna 27° 50′

[illegible]

Rev. VII. 192. 24. [illegible]

Aequatio temp. physica [illegible] add. his [illegible]

Ergo h. 12. 48′ Lincii, initium h. 12. 4½.

Parall. ☽	58. 29			
„ ☉	0. 59			
	59. 28			
Semid. ☉	15.			
„ umbrae	44. 28			
„ ☽	15. 0			
Summa	59. 28	—	14. 250	
Lat.	56. 0	—	18. 270	
Se. def.	3. 28			77800
Digit	1. 24			
Se. dim. dur.	19. 57		01. 690	[illegible]

Dimidia duratio h. 0. 45′ 28″. [illegible] vatione et cum quantitate perexigua [illegible]

Lubet autem explorare, quanta fuerit [illegible] semidiametri longitudinem habeat. Fuit [illegible] lata 14′; dimidium 7′ est [illegible] complementi in Luna erit 13′ 46″, in [illegible] 57′ 6″, quae differt a summa semid. [illegible] Fuit autem procul dubio minus aliquid, [illegible] esset tanta, nisi lucida sese dilataret [illegible] restat minus quam 14′ 24″, hinc [illegible] sesquidigitus seu 1. 42′. Haec [illegible] patitur, quod ex [illegible] patet.

Satis [illegible] apparet, calculus [illegible]

XXXIII. [illegible]

[illegible] Liber justus fieret, si [illegible] Causa perplexitatis fuit, quod [illegible] exempla plura nondum [illegible]

[illegible]

pedis Geminorum duas claras vicinas invicem, nondum tamen angulus ad priorem stellam rectus erat.

Postea versus quadrantem primum provincialis (correcte versus h. 14. [illegible]) cum deficeret quarta pars, angulus hic rectus erat, et plus aberat stella a margine sibi proximo, quam est una diameter Lunae. Nihil accuratius potuit notari, nequibant enim eodem intuitu simul aspici et Luna et stellae ob claritatem Lunae, sed quoties stellae erant respiciendae, tegenda fuit Luna tigillo fenestrae.

Inter h. 14. 48′ et h. 15. 3′ notatum, quod centrum Lunae jam satis evidenter visum fuerit ultra perpendicularem in lineam stellarum ex stella priore, et quod [illegible] jam deorsum vergeret et quod dimidium in umbra fuerit. Distantia stellae a proximo margine paulo major diametro Lunae.

Circiter h. 15. 6′ correctam, cum bes in umbra censeretur, jam occidentalis margo in dictam perpendicularem incidebat. Linea per apices cornuum nondum erat parallela pedis stellarum lineae: sed ne quidem h. 15. 19′. Quartam restare putabam, quintam Gringalletus adjutor meus. Rubebat Luna in umbra clarissime.

Paulo post circa h. 15. 33′, cum parallelae forent lineae, quod hoc medium [illegible] arguerat, consideravi latitudinem residui cornu, quae tertiam partem occupabat ejus, quod ego telescopio meo comprehendo; comprehendo autem [illegible] 44′ seu duas quintas Lunae. Erant ergo 4′ 20′ circiter. [illegible] inter quintam et quartam partem circumferentiae censui in lumine, [illegible] ad sextam attenuabat. Latitudo lucidae ad latitudinem obumbratae [illegible] ut 1 ad 8 circiter; nihil enim accurati dici potuit, etsi pars obscurata in [illegible] erat.

[illegible] Hora 16. 18′ correcta linea per cornuum extrema tendebat in secundam ex [illegible], ejus vero perpendicularis per centrum tendebat simul in primam, sic ut [illegible] formarent [illegible] inter stellas. Confirmabatur haec [illegible] per aliam, quod ductae ex stellis in centrum Lunae viderentur formare [illegible]. Nondum autem distabat Luna aequaliter ab utraque stellarum, [illegible] Erat in lumine paulo plus quam quarta diametri. [illegible] h. 16. 18′ et 16. 33′ [illegible] in verticalem [illegible] et distantia Lunae [illegible] utrinque aequata fuit.

[illegible] 16. 48′ Luna [illegible] sua diametro a stella secunda [illegible] margine proximo; in limbo [illegible] quarta diametri, [illegible] plus quam tertia. Altitudo oculi [illegible] horam prae- [illegible] altitudo [illegible] in Orione 10°.

[illegible]

Calculus meo [illegible]

☉		☽
1619. 17. 21. 37 — 6. 3. 20		1618. 27. 12. 44 [illegible]
Dec. 10. 15. 55		Nov.
175. 18. 1 — 22. 12. 44		1. 9. 343. 15. 35.
30. 39		371. 4. 12. 39
15. 20	Rev. XIII.	355. 5. 7. 34 — 1. [illegible]
3		12. 23. 21. [illegible]
☉ 25. 2. 6 ♐		35. 55 [illegible]

Parall. ☽ 65. 37
☉ 1. 4
64. 33
Semid. ☉ 15. 55
umbrae 49. 3
☽ 16. 21
Summa 65. 26 — 18. 126
Arcus lat. 35. 52 — 65. 440
Sc. deficiens 29. 34
Sc. dur. dim. 54. 44 — 12. 000

[illegible] correctam, cum [illegible]

Horaria ☽ [illegible]

☉ [illegible]

☽ [illegible]

Dim. duratio [illegible]

Majusculam aequationem subtraho [illegible] orbitam Lunae; sequor igitur Tychonicam [illegible] media. Sed aequatio physica 1° 17' [illegible] hic [illegible]

In duratione et quantitate [illegible] sunt enim 2' 47", quae sunt digitus unus [illegible] superesse [illegible]

Quantitati ad [illegible] cum [illegible] rinis, [illegible] loca duarum stellarum [illegible] distantiae [illegible] quibus stellis [illegible] reliqua [illegible] stellae [illegible] minuto [illegible] habent.

[illegible]

et linea [illegible]

[illegible]

[illegible] differentia longitudinis [illegible], ex [illegible] fabrica ([illegible], non nempe est additum, diametri ad circumferentiae [illegible]), quae ex temporis intervallo constituta fuit 48′ fere. [illegible] igitur verum Lunae locum satis comprobatum utraque via. Oportet jam [illegible] in [illegible] visum.

A. R. M. C. 127° 12′. Nonag. 27° 12′ [illegible]
☽ 28. 17 ♊

Dist. a Nonag.	28. 55	— 72000	
Angulus or.	61. 47	— 12651	— 74007
Parallaxis ☽	63. 37	399000	— 399000
		[illegible]11	— 173907

Parall. long.	0. 27. 12	Lat.	[illegible] 5″
	28. 17. 20		37. [illegible]
Visa long. in ecliptica	27. 50. 8	Visa lat.	7. 10 sept.

[illegible] igitur centrum Lunae est in septentrione, stella paulo plus 3′ secuta est hunc locum, ut fuerit in 27° 5[illegible]′ 8″ ♊, quae collocatur in 28° 8′ ♊, per 15′ [illegible] quam observamus, posito [illegible] Solis vero, ut is ex Tychone computatur. At [illegible] aestimatam quantitatem [illegible] ad summum 5′ ferret fixa promotior, [illegible] 10′ differens a loco ex Progymnasmatis accepto. [illegible] posito, oportet phasis [illegible] 8′ serius justo esse annotatum.

[illegible] autem simul etiam hoc, quod [illegible] stellae et visae [illegible] 30″, unde ablata semidiameter ☽ relinquit [illegible] circiter, [illegible] diametri ☽, quod est observationi consentaneum. Distabat enim [illegible] plus quam diametro ☽ dilatatae in oculo [illegible] claritatem.

[illegible] alind momentum: h. 16. 18′ [illegible] par fuit [illegible] stella. Est [illegible] stellarum distantia 55′ 30″. [illegible]

[illegible]

[illegible] propter [illegible] stellarum ad eclipticam.

[illegible] ex intervallo temporis [illegible]

[illegible]

Ergo si aequaliter abfuisset Luna ab [illegible] attigeret 27° 54′ ♊, [illegible] quia Luna illi [illegible] paulo ultra 27° 54′ ♊, sed ponitur in 28° 8′ ♊ [illegible] minus, nam intra pauca minuta additur, jam [illegible]

Consulatur denique etiam h. 18. 18′, tunc enim L[illegible] ad visum jungebantur secundum longitudinem [illegible] horarius in tanta distantia [illegible] oppositionis [illegible] Intervallo igitur respondeant 1° 35′ 45″, [illegible] in medio, constituit locus ☽ 0° 11′ 13″ ♋, [illegible] 27′ [illegible]

[illegible] ☉ [illegible] AR. M. C. [illegible]

[illegible] ☽ [illegible] ♋ [illegible] 0. 27. 12 [illegible]

Dist. [illegible] — 75139 [illegible] 82 [illegible]

Ang. or. [illegible] 60 — 38797 — [illegible]

[illegible] 300000 [illegible]

[illegible] 44039 [illegible]

[illegible] 0. 42 [illegible]

[illegible] 0. 41 [illegible]

[illegible] locus [illegible] 59 [illegible]

At calcis ♊ locus in 27° 59′ 0″ ♊ a Tycho[illegible]

Quod hic intervallum locorum [illegible] in [illegible] Luna [illegible] stella [illegible] ubi [illegible] tetendit, sed simpliciter in [illegible]

[illegible] aliquid ad hujus rei [illegible] Tunc [illegible]

[illegible]

[illegible] 1595. 1599. 1609. [illegible] pot[illegible] [illegible] [illegible] [illegible]
[illegible] [illegible]avi eclipsin anni [illegible] in eodem signo [illegible]
[illegible] vel [illegible] procidisse, quod in hac.* Vide et eclips. [illegible]
[illegible] fixarum salvatur etiam pulchrum illud et plane [illegible]
[illegible] quod h. 16. 18′ linea per apices cornu[illegible] ducta venisset in [illegible]
[illegible], linea huic perpendicularis ex centro [illegible] [illegible]erem. Nam etsi quod
[illegible] per literas monuit, nihil certi sequitur ex hoc angulo [illegible] [illegible]
[illegible] [illegible] punctis semicircumferentiae in stellas terminatae [illegible]
at simul hoc incidit, ut distantia Lunae a stellis esset quam proxime [illegible]
quo simul considerato sequitur jam ultro certus puncti al[illegible]us, in [illegible]
[illegible] esse lineae, quod erat aditus centro Lunae [illegible] erat [illegible]
[illegible] quantum dimidium stellarum intervallum [illegible] 15′ 30″. [illegible]
[illegible] stellarum, extensis versus eclipticam [illegible] exiguo [illegible]
[illegible] quia tanta est latitudo loci inter stellas intermedii, [illegible]
[illegible] secat versus [illegible]teriorem. Recte itaque prodit [illegible]
centri visa australis. Oportuit [illegible] paulo majorem [illegible], quas[illegible] latitudo
Lunae septentrionalis, major [illegible] nodus ☊ sequens [illegible] in antecedentia
[illegible].

XL. Eclipsis Lunae anno 1620. [illegible]

[illegible] eclipsis Tubingae a M[illegible] est observata, ([illegible] ejus filio [illegible]
[illegible] Hassiae [illegible] Philippum perscriptum fuit), coelo valde nubilo nec [illegible]
[illegible] Initium ex altit. Arcturi [illegible] 20′ colligit [illegible] 11. 38′. To[illegible]
[illegible] 32° i. e. h. 12. 45′. [illegible] h. [illegible] ex alt. [illegible]
[illegible] fuisset h. [illegible] 34′ et [illegible] h. 13. 30′ [illegible] h. 1. [illegible]
[illegible] fuit eclipsis h. 15. 25′. Duratio h. [illegible]. Stuccardiae Ritelius
[illegible] alt., 43°, Lunae 16°, 30′. Tota immersa in altit.
[illegible] 30′ [illegible] Aquilae 18° [illegible] h. 2. 15′.
[illegible] Arcturi altitudo fuisset 19°. Quae [illegible] observatione
[illegible] meridianas proxime [illegible]. [illegible] 19°
[illegible] post [illegible] [illegible]
[illegible] potuit, ut utrinque [illegible]
[illegible] contendunt Landgr[illegible] [illegible] 18′ [illegible]
[illegible] error
[illegible] Tubingae [illegible] sinunt.
[illegible] Quie-
[illegible] h. 1[illegible] totalis non [illegible] circa
[illegible]

[illegible] 22'. Tunc h. 14. 39' [illegible] medium L[illegible]
[illegible] h. 1. 32', ut et [illegible]
[illegible] H. 14. 52' [illegible] inchoat[illegible]
[illegible] in h. 1[illegible] fere ut [illegible]
in h. 12. 38', ac. 47' [illegible] ad h. 14. 5[illegible]
h. [illegible] in altit. 8° 20' [illegible]
[illegible] cum Luna post [illegible]
[illegible] 54'. [illegible]

[illegible] Lincensi et [illegible]
[illegible] (15') Rubenti [illegible]
[illegible] 6' [illegible]
[illegible], non rep[illegible]
[illegible] principio [illegible]
[illegible] tabulis [illegible]

[illegible] Tychonis, [illegible]

Medium calculo Tychonis [illegible]
et post [illegible] observatum [illegible]

[illegible] 28' 48' [illegible]
[illegible] ☾ 16. 12. [illegible]

[illegible]

Erunt scr. durat. dimidiae	53′ —″	—	11. 890
Summa semidd.	60. —	—	15. 230
Ergo arcus lat.	28. 5	—	03. 340
Differentia	29. 43	—	03. 735
Scr. morae dimidiae	9. 35	—	00. 395
Mora dimidia	— 20		
	1. 51		
Incidentia	1. 31		

Dist. a nodo 5° 4′. Nodus ☊ in 29° 9′ 32″ ♐.

Hic incidentia fieret nimia. Non potest enim ultra h. 1. 17′ ad summum extendi. Praetereaque promotio nodi prodigiosa fieret. Quibus angustiis eo manifeste adigimur, ut dicamus, umbram Terrae hac vice fuisse parvam praeter solitum. Ac nescio an quid ad rem faciat, quod annotavi, coelum in ortu ferruginei coloris, Lunam rubicundam praesertim occidentem, quodque Luna usque adeo delituit, ut penitus amitteretur. An densior aliqua materia, pellucida tamen, totam Terram amiciebat, quae refractos Solis radios clarissimos ex partibus marginum Terrae adversis in oppositos umbrae margines mitteret, ut in schemate Opticorum fol. 304 οεηQωφϱ et νλγιQψχτ ex parte una, sic ξδζPωψσ et μκβϑPφχυ ex parte vel plaga altera? ut sic rubor Lunae in densa aura non distinctus fuerit, et Luna B in regione quidem umbrae consistens, extra tamen umbram in lumine censeretur.

Addant etiam inclinationes suum testimonium: nam et principium obscurationis et principium repletionis utrumque vergebat a medio Lunae margine sursum paululum. Atqui in principio ecliptica a meridiano versus Lunam a sinistris appropinquantem tendebat insensibili aliquo deorsum: si ergo margo Lunae superior medio sensibiliter delibavit umbram, Luna australis fuit sensibiliter ab ecliptica. In principio vicissim repletionis ecliptica a centro umbrae, quod jam multum transiverat ad dextram, tendebat versus sinistram sursum, sensibiliter valde. Quodsi etiam linea per centra tetendit sursum ab eodem centro umbrae sensibiliter: Luna igitur eclipticae fuit vicina valde, sive in boream transgressa, sive in austro restans. Quantitates non sunt determinatae; supersedeo igitur computatione angulorum. Sufficit, inclinationes latitudini (quod non ita magna fuerit, ut duratio per legitimam umbrae diametrum postulare videbatur) testimonium praebere eminus.

Fixam, quam vidit Remus sub Luna, minimarum unam esse puto, quae solo telescopio videntur; nihil igitur conducit ad examinanda loca fixarum.

XLI. Eclipsis Lunae anno 1620. $\frac{29.\ \text{Nov.}}{9.\ \text{Dec.}}$

Hanc eclipsin observavi Stuccardiae adjutus a Frid. Rittelio et aliis matheseos studiosis, exstatque cum superiori impressa.

Luna orta in parte coeli nubila. Ut primum emersit e nube, defecerant digiti 8. Alt. ♃ 24° 20′, hora igitur 4. 54′. Altitudine ♃ 26° 30′ perierant 10 digiti, alt. ♃ 27° 40′ nondum tota erat immersa, sc. h. 5. 15′. At cum esset oculi Tauri altitudo 13° 25′, sc. h. 5. 16′, jam tota erat in umbra, lucidior tamen ad occasum. Tunc Luna erat alta 11° circiter. Appropinquabat lineae cornuum ♉, cui phasi diligenter intenti fuimus.

H. 5. 36′ adhuc erat lucidior pars ad occasum aequabatque lumine oculum ♉ vicinum. H. 6. 10′ jam lucidior erat ad sinistram sursum versum, cum tamen Luna in australi parte umbrae incederet. In altitudine ♃ 39° 24′, ♄ 10° circiter centrum erat in linea cornuum exacte, hora ex Jove 6. 30′, ex Saturno 6. 35′ circiter. In altit. ♃ 42° 30′ jam coeperat emergere, mira facie, margo luminosus versus ♄ et pedem ♊, rubor versus caput Erichthonii. In medio angulus ater, meram lucem a rubore discriminans, specie vomeris. Hora indicatur 6. 51′. Paulo post alt. oculi ♉ 30° dedit horam 6. 57′.

Cum oculus ♉ attolleretur 39°, sc. h. 7. 54′ tota emerserat, superius tamen atra macula restabat, et splendor ille superfluus circa Lunam adhuc frangebatur in meis oculis. Rittelius non pronunciavit liberam, usus telescopio, usque dum

♉ attollebatur 39° 45′ [illegible]

6. 56′ coeperit [illegible]gere, [illegible]

[illegible] tempus [illegible] h. 6. [illegible]

h. 4. 1[illegible] [illegible] L[illegible]

conficeretur [illegible] 3. [illegible] sed ex [illegible]

[illegible]cheris, qui [illegible]

☉ 1[illegible] 33 ♐. ☽ 1[illegible] ♊. — [illegible]

[illegible]

... esset observatio, quae [illegible] quidem oritur h. 17 [illegible] occidendi, medium igitur [illegible] 45 Lincii. Ergo haec observatio [illegible] certi colligi potuit ex illa solitudine [illegible]

XLIV. [illegible] Lunae. anno 1724. [illegible]

[illegible] Lincii. Fluvius [illegible] vis [illegible] bus [illegible] Ritte [illegible] emergere [illegible] in [illegible] logio [illegible] directe [illegible] altitudo [illegible]

[illegible] Calculus [illegible]

[illegible] 0. 12 [illegible] 1680. [illegible] 6. 17 [illegible] 50 [illegible]

[illegible] 80. 45. 15 [illegible] 83. 6. [illegible]

[illegible] 89. 47 ♈ Rev. III. [illegible]

[illegible] 86. 46 [illegible]

Summa [illegible] 50. 15 [illegible]

Longitudo 54. 21 [illegible]

[illegible]

[illegible] verus ☽ a ⊙ 28. [illegible]

[illegible] 78920 [illegible]

[illegible] 10360 [illegible]

[illegible]

5. [illegible]

6. [illegible]

Praedixit [illegible] minorem [illegible]
His mora longior [illegible] minorem, digito[illegible]
[illegible] Maestlinus habet [illegible] quanta[illegible]
nequaquam consentit cum [illegible] defectus, [illegible]
[illegible] angulo, latitud[illegible] Etenim in hora[illegible]
vitium, eritque 1° [illegible], diam. [illegible] 22″. E[illegible]
[illegible] vult Maestlinus: quaeritur pro[illegible]tio semid[illegible]
[illegible]itas diam. ☽. [illegible] 34′ 2[illegible] 56710[illegible]
30′ [illegible] 387000[illegible]
[illegible]710[illegible]
ciant 33′ 20″ lo[illegible]0.
[illegible]pl[illegible]0′ — [illegible]
Arcus 54′ 22″ log. [illegible]572[illegible]
19744 [illegible] quad[illegible]
quadrat[illegible]
At diame[illegible]
Ergo Arcus [illegible]
[illegible]

Responderet motus latitudinis angul[illegible]
magno 4° 33′ [illegible] [illegible] com. [illegible]

Omissa igitur Maest[illegible]ana quantita[illegible]
haeret in eclipsi 1616) consideretur [illegible]
possit pars lucida. [illegible] parva [illegible]

1. Parallaxis [illegible] major [illegible]
2. [illegible]

[illegible]

[illegible] septem quadrantum horae, quod nimium est. [illegible] nihil [illegible] obser- [illegible] Regius praedixit mihi durationem futuram h. [illegible] [illegible] 2. 52', posse etiam correctum fuisse horologium; pone [illegible] fuisse [illegible] 45'.

[illegible] sit 4° 45' 9" [illegible], et reductio 2' 34", [illegible] in 4° 47' 43" [illegible] parallaxis [illegible] 58½", ☽ 54" 53", [illegible] 52", et semid. ☉ [illegible] ergo [illegible] umbrae 40' [illegible] Sed semid. ☽ 15' 3" [illegible] duratio 52 [illegible] horarius [illegible] a ☉ 27' [illegible] adde logarithmos 13353

78750

92103,

55' 55" Antil. 13. 20

[illegible] scrupula 23' 53" — 2. 41

et lat. [illegible] 50' 30" — 10. 79.

Ergo hic [illegible] lat. 50' 30" dat motum latit. a ☉ 9° 9' 5", posito meo [illegible] latitudinis. Et quia latitudinis arcus esset 50' 30", quare hoc ablato a [illegible] diametrorum 55' 55", relinquerentur scrupula deficientia 5' 25". Digiti [illegible] quod certe potuissem aestimare.

[illegible] scriptum exstat, transversam [illegible] defectus pene [illegible] ☽ [illegible] 7' [illegible] 0. 2078

Semid. umbrae 40. 52 — 7. 189

☽ 15. 3 — 0. 968

40. 18 — 0. 9127

13. 19 — 0. 7507

Esset arc. latit. 53. 34

[illegible] defec. 2. 21. Minus uno digito.

[illegible] 9' 43". [illegible] 53' 34" [illegible] 15

et [illegible] 55. 55 — 12. 2

[illegible] 15. 45 [illegible]

[illegible] 27. 17 [illegible]

78753

Dim. [illegible]

[illegible] duratio h. 1. 10', aut eo [illegible] verisimilius, quia mane obser- [illegible] tempore, quam [illegible] defectus; denique [illegible] tolerabilior.

[illegible] autem in calculo meo prodeat minor defectus, [illegible] vix tangatur umbra, [illegible] habere [illegible] 1. [illegible] major [illegible] minor

[illegible]

Ergo 0. 255 est antil, dim. sect. 7. 45

sectio 15. 30;

paulo plus semidiametro ☽. Nec n. in ipso medio

Harum 2 eclipsium magna est

quae in altera desunt, sed propter locum

erat apogaeo vicinus

signabat

diameter, datur crassities umbrae et summa

1618. 27. 12h

Majus 151

15. 12. 52

194. 1. 34

Revol. VII

Ergo medium

centri 153° 30′. Diameter ☽

24′ 42″ et eo plus in

in 43′ 8″ horae

aberat a principio

quiro centrum Solis

refracto

latitudinem

esset

in perpendiculo

circa

definit observatum . . . horae fuit
. . . 8. . . ., calculus meus dat h. 8. 55 . . .
. . . repetam . . . ex emendatione . . . Apr. 1620.
. . . repeto locum ☉ . . .
. . . ☊ in 20. 51
. . . lat. . . . de lat. . . .

Ex emendatione 11. Apr. 1620.

☉	. . .		1		
☽	65. 57		65. 3		
	64. 57		64. 3		
☉	15. 8		15. 8		
	. . .		48. 55		
☽	. . .		16. 12		
1. 6. 19	Antil. 18, 61		65. . . .	Antil. 47. 850	65. 7
15. 56	1. 074			1. . . .	15. 56
	17. 536				. . . 11
	5. 05 . . .		27. . . .		
	3. 62 . . .				
. . . 21	— . . . 774				
dim. . . . 4. 23				H. 1. 48. 3 dim. dur.	
. . . 42	— . . . 218		32. 43	— 4. 536 (— 1,074)	
H. 1. 52. 25	— 12441			3. 456	
29. 36	— 71222		28. 35 se. incr.	74160	
51. 26	+ 18659		. . . ☉ 34' . . .	34000	
				. . . 160	
				40. 2 dim. incr.	

. . . Romae . . .

. . . Liscii	h. 9. 50		. . .	9. . . .
. . . Romana	8. 52. 27		. . .	8. 60
. . . meridiano	8. 51. 28		. . .	8. 10
. . . Romana	7. 14. 31		. . .	7. 21
Liscii	7. 15. 3		. . .	7. 22

. . . 8. . . . obs. . . . egregie congruunt quoad durationem.
. . . Romae . . . observatum, accurate. . . .
. . . altitudine . . . 7. 14,
. . .

. . . Sol occidit
. . . ☽ motu
. . . per parallaxin,
. . . fuerit? Prae-
. . . Amplius,
. . . refracta in
. . .

☽ 1616. ... 22. 47. ...
Julius 21. 217. 8. ...

231. ...
Revol. VIII. 220. 10. 23. 39. — 0. 24. ...

10. ... 38. 7 — 6. 3. ...
35. 12 ... 19...

☽ 23. ...

Ergo h. 8. 23. 0 aequali Uranib.
10

... 3. 0 ... Lincii ...

29. ...

... igitur hic 2... ad ...
si physice aequam, ...
in calculo promotior ...
haec et minuta ... minuitur ...

Quarta eclipsis Lunae, Anno 1616.

Differ. meridd. Tubingae ...

Principium ...
... 1. 43.
Lincii ... 1. 50

... aequatio ...
Tempus ...
1616. 15/25 Jun...
16/26 ...

... omnia egregie consentiunt quoad durationem ...
... observatum, ...
... complete ...

82. 50

... incidit
... ☽ motu
...
... Ptol...
...
... perpendiculo ...

[illegible]. 50. 41 [illegible] Ap. 1. 26. 58 Quaerat [illegible] acceptionem [illegible] tabula.
— 2. 10. 39 [illegible] 7 [illegible] 172. [illegible] — 42. 36
[illegible] 10. 21 — 5 [illegible] 16 — 37. 10
— 27 1. 28. 10 [illegible] 24 [illegible] 5. 16 ; [illegible] 8. 44
5. 22. 12. 8 quid 60? [illegible] 5. 29
48 [illegible] 43. 40
5. 21. 29. 8 — aeq. 48. 0 4. 22
1. 28. 10 Hic aeq. 43′ 4″ 48
5. 22. 57. 18. Diff. est 1″. Hic igitur tabulae nullum faciunt errorem.

Haec infra ex emend. 11. Apr. 1620. inveni [illegible].

Parallaxis [illegible] 0″ Horarius ☽ a ☉ verus 35′ 27″ log. 52440
[illegible] ☽ [illegible] Superf. sc. [illegible] dim. 25 [illegible] 3 — [illegible]
[illegible] S[illegible] dim. 11. [illegible] —
Semid. ☉ [illegible] 1. 30. [illegible]
Semid. [illegible] 0. 19. — 111590
[illegible] 15. 23. [illegible]
Sum [illegible] 7. [illegible] Antil. 19. 17[illegible] Initium [illegible] 37
[illegible] 32 [illegible] Antil. 4. 274 Incidens. [illegible] 50
Semid. ☽ 16. 44 Medium [illegible] 34
[illegible] quam umbr. 48. 31 Emersio 15. 48. 14
[illegible] umbr. [illegible] ☽ 33. [illegible] 4. 85 Finis 17. 3. 31
[illegible] 29 [illegible]
[illegible] 11. 4[illegible]

[illegible] 1620.

[illegible] igitur [illegible] computo majorem et longiorem, quam [illegible] vel [illegible] ad meam magnitudinem observatam, sed procul dubio [illegible] accedit. [illegible] quod etiam duratio [illegible] observata [illegible] 12, quae [illegible] conficiuntur latitudine [illegible] minuta. [illegible] eccentricitatem novam, sed alia ratione [illegible] in [illegible] [illegible] speciei [illegible] motu [illegible] esset [illegible] Hic in Hip[illegible] adversariis. [illegible] 1620, [illegible] simplici ☽ [illegible] majore [illegible]

[illegible] ☉ 1′ 0″ [illegible]

[illegible]

Revol. [illegible]	[illegible]	14	0. 27. [illegible]
	[illegible]	4. 18. 50	4. 24. [illegible]
	[illegible]	35. 56	5. 22. [illegible]
		115800	
		51250	4. 1. 51

Astron. aequit[illegible]

[illegible] debitum [illegible] apogaeo, ut [illegible] juvat.

23. Apr. 16[illegible]

5. Apr. 1620.

1616. 26. Aug. st. n. [illegible]

1617. 16. „ [illegible]

1619. 20. Dec. „ [illegible]

Intervalla d. 354 [illegible]

[illegible]

[illegible] non est in perigaeo primae, aut major [illegible]. Sit primae [illegible] 1° 48′, aequatio 0. 10′ 0″ add., erit secundae anomalia [illegible] 25″, [illegible] 3. 37. 10 subt. Sit denique primae aequatio 0. 11. 0 add., erit secundae anomalia 4s 16° 3′ 25″, aequatio 3. 36. 34 [illegible].

Sic conciliatae sunt duae, stante hac eccentricitate.

Jam igitur ad tertiam.

[illegible] quia secunda in 23° 42′ 21″ [illegible]	
Adde Ap. 3s 5. 22. 12	Anom. 4s 16° 3′ 25″
et an. 27. 45. 29	27. 45. 29
26. 50. 7 ♊	Anom. tertiae 13. 48. 54
2. 8. 7	Dat aequationem 1. 28. 25 sub.
Esset tertia in 28. 58. 14	Erat secundae aequatio 3. 36. 34 sub.
At est inventa in 29. 4. 16 ♊	Diff. 2. 8. [illegible]
Tantum 6′ deficimus.	

[illegible] igitur aequatio parte [illegible], quia in duobus [illegible] aequationem [illegible]

3° 47′ 28″	[illegible] 23° 42′ 21″
Adde 3. 47	Nov. [illegible]
3. 51. 15	[illegible] 27. 35. 5
Hoc quaerendum et valebit 3. 47. 48.	[illegible]
Igitur sit primae anomalia	30′ 19. 36
6s 4° 10′ aequatio [illegible] add.	[illegible] 20
[illegible] 4. 16. 14. 25 aeq. [illegible] sub.	5. 16. 28. 44
[illegible] 40. 29	5. [illegible] 48. 54
[illegible] 3. 54 aeq. [illegible]	[illegible] 50
2. 11. [illegible]	
Haec est minuenda parte [illegible] 2. [illegible]	Nimio vero [illegible] anomalia.
2. 9. 3[illegible]	

Per aequationem maximam 4° 55′ [illegible] 1. 26. [illegible] debueramus per [illegible] aequationem, ut [illegible] 6′. Esset aequatio 4° [illegible]

[illegible] hoc sit, probo [illegible]. [illegible] aequatio parte [illegible] requisita ad [illegible]

[illegible]

Est igitur [illegible]

[illegible] 14. 4. 28 [illegible] 3. 48. 49 sub.

[illegible]

Primum igitur intervallum ...

... Respondent motus anomaliae ...

Ergo anomaliae intervalla correcta 10^s 14° 4′ ...

7.			
10.	14.	4.	32.
27.	45.	28.	
8.	0.	44	
Alterum 27.	37.	28.	

Sit prima in perigaeo, secunda habebit ...

Sit rursum primae anom. 6. 2. 10 ...

27. 37. 28

Ergo tertiae ... 32. 0 — 1. ...

Diff. 2. 17. ...

Hic nos aequatio ... abducit multo longius.

Sed ...

Anomaliae ...

Cum in his tribus ...

temporis, quo ...

Alia tractatio harum trium eclipsium.

Ut incipiatur a 2 ultimis.

Quia prima et ultima sunt prope perigaeum, major erit earum diaphasis, cito enim mutatur aequatio.

Sit prima 3° 55′ 12″ ♓	Apog.	4. 14. 52. 24 —	3. 55. 58 ♓ —	4. 14. 52. 20
Tertia in 29. 4. 16 ♊	Anom.	11. 11. 49. 54 —	29. 4. 23 ♊ —	11. 11. 41. 53
Diff. 115. 9. 4		3. 26. 42. 18 —	3. 25. 8. 25	3. 26. 34. 13
		3. 25. 9. 4		3. 25. 8. 25
	Summa aequat.	1. 33. 14		1. 26

At cum usurparem anomaliam 5ˢ 13° 48′ 54″, etiam anomaliam 6ˢ 1° 59′ 0″, collegi 1° 39′ 25″.

Retrocedendo igitur cum apogaeo per unum gradum conficio hanc summam: ut 5ˢ 12° 45′ dat 1° 34′
et 6. 0. 55. 6 dat 0. 5. 6.

Hem! praeter opinionem manet ad sensum quantitas eadem, sc. quia loca [illegible] sunt perigaeo valde vicina. [illegible] vel in [illegible] solis. [illegible] differentia anomaliarum est 18° 10′ [illegible] Haec [illegible] perigaei appli[illegible] non dat minus quam 1° 39′ per 4662. [illegible] appli[illegible] dat paulo plus quam 1° 40′.

[illegible] Tychone dat 1° 36′
1. 32, sed eccentricitate minori.

Per has igitur duas perigaeas [illegible] ut aut [illegible] aut Solis apogaeum promoveatur, aut [illegible] temporis [illegible] physicae aequationi [illegible]

[illegible]

DE LUNA.

[illegible] manet [illegible]

Assumta hac aequationum hypothesi, [illegible] sint ad [illegible] eccentricitate. [illegible] in copulis 8672. [illegible] eccentricitas orbis [illegible] eccentrici 2° 29′ 20″; aequatio vero [illegible] quadraturis est aequantis [illegible] tota 7° 26′. [illegible] quantis enim in quadraturis duplo [illegible] in locis intermediis, quae [illegible] ad sinum totum, eadem aequatione [illegible] prima aequantis secunda, phasmatum tertia) [illegible] igitur aequales sunt prima et secunda [illegible] Aequationes autem non [illegible] [illegible] 3° 44′ [illegible] que minus in [illegible] diametro. [illegible]

Aliter tertio. [illegible]

Ergo per se centrum eccentrici describat figuram ovalem circa centrum Terrae motu apogaei, ita ut diameter virtuosa non sit, sed semper centrum Terrae. Contra facit, quod haec inaequalitas a vero loco Solis pendet et quod nova pro octantibus esset contingenda ratio. Ergo de prioribus [illegible] [illegible] dimensiones, an etiam octantes complectantur.

Ponatur centrum in diametro (◎ ☌) [illegible] 4336. Maneat interea ibi (nam vix 13 vel 15 lunationibus periodum absolvit), Luna vero ab apogaeo volvatur in long. mediam et quadraturas. Si virtus maneret eadem, aequatio secunda esset 2° 29⅔; jam est 4° 58⅔, ergo 90 radii paulatim a diametro (◎ ☌) [illegible] et paulatim longiores, sunt per 2° 29⅔ tardiores, quam totidem manentes in diametro et longiores, et per 4° 58⅔ tardiores, quam 90 medii, egredientes [illegible] a diametro in quadraturas. (Nota Kepleri in margine: „hoc dubium".) Sed [illegible] egredientes e diametro in quadraturas volvunt 90°, ergo 90 paulatim [illegible] sunt ad 90 medios, ut 94. 58⅔ ad 90, ut 90 sinus eccentricitatum ad [illegible] sunt ut 4. 58⅔ ad 90. Ita 90 sinus 90 eccentricitatum sunt ad radium, [illegible] ad 1. Sed 90 ordine sinus sunt ad radium, ut tangens semiradio [illegible] [illegible] fere, ergo ut 57⅔ ad 1. Ergo 90 sinus seu eccentricitatis sunt ad [illegible] totae simplices, et per consequens eccentricitas ad radium ut 4. 58⅔ ad [illegible] Est itaque [illegible], ratione virtutis. Ergo si censetur [illegible], erit centrum [illegible], qualium radius 100000, sed [illegible], ut omnes radii eccentricitatum [illegible] sint proportionales suis longitudinibus, quod tamen non est. Nam longiores [illegible] virtutis, cum sint [illegible] [illegible]

[illegible]

[illegible]. Illis igitur colliguntur [illegible] [illegible] ad nihil.

At rursum, instatur, haec illius summa est [illegible] totam distantiam in quadraturis versantem [illegible] 2⅓ sit major. Falsum inquam hoc est. Nam quod [illegible] turis versatur, id causatur inaequalitatem [illegible] in quadraturis [illegible], id demum facit inaequalitatem [illegible]

(1601. [illegible])

Imo dicam aliquid amplius. In quadraturis [illegible] damnum afferunt ejusdem virtutis [illegible] diametro initio parvae virtutis [illegible] aequaliter virtuosa, [illegible] in [illegible] augetur damnum, estque in quadraturis maximum [illegible] longior sit sinuum dimidia pars [illegible] octantum inaequalitas, quam [illegible] octantum aggravationem [illegible] tionem inaequalitatis [illegible] distantiarum in diametro [illegible] igitur in diametro (supra [illegible]) quadraturis. Luna igitur duplo [illegible]

Iterum ab hoc exemplo [illegible] punctalis (?) quadraturarum [illegible] etiam tale damnum [illegible]

[illegible]

[illegible] Terram cadit, ad mor[illegible] [illegible] [illegible]
[illegible]. Ergo quia sinus omnes, seu 57[illegible] [illegible]
[illegible] vel toto eccentricitas in quadrantibus semel [illegible]
[illegible] quia 4396 valent 155″, quid 100000? 3575″ [illegible]. [illegible] quod locus [illegible]
[illegible] in quadrantis vertatur, facit temporis 1[illegible] fere accrescere, [illegible]
[illegible] quantum faciat accessionem elong. ☽ a ☉ 89[illegible]

Primo ut 100000 ad 99[illegible], sic 3575 ad 3574½; deinde ut

100000 ad 98255, sic 3574½ ad justum 3512.

[illegible] 3575 in omnes sinus ordine, et rejice 7 ultimas; quod prodit, multiplica in omnes [illegible], incipiens a toto vel maximo, et abjice ultimas. Vel multiplica 3575 in summam sinuum 45 majorum, quotientem multiplica in summam sinuum versorum majorum 45 [illegible] per 45 totos. Habetur summa versorum, si summam sinuum subtraxeris a totidem. Summa 45 minorum sinuum est 1718467, summa 90: 5775066, summa 45 majorum: [illegible] ($\times$ 3575) = 145200, tantum esset, si perpendicula omnia in Terram caderent, [illegible] vel 40° 20′, 104[illegible] dat 59, quid 100000? [illegible] 56¾. 56′ 45″ + 2′ 28″ = [illegible]″, 56′ 45″ − 2′ 28″ = 54′ 17″. Haec bene cum quadrantalibus parallaxibus.

Lunae recapitulatio et eclipsium.

[illegible] de novo inciperem restituere motus Lunae, hunc potissimum [illegible] Solis diametrum observavi in apogaeo 29′ 30″. Consentit Maest[illegible] cum datis suis: etsi in Progymnasmatis majorem faciat, sed [illegible] alicubi vidi.

[illegible] 15″ = 429; ut 100000 ad 101800, quid 4291 — 437, [illegible] 15″ [illegible] media erit 30′ sine additamento. In apogaeo 29′ 30″ [illegible]

[illegible]

vel 2° 45′. Compl. 87° [illegible] 86° 15′ [illegible]
2 residuas gradus [illegible] breviores [illegible]
facit 433, quid 99000 vel 99780 [illegible] sunt ergo
vel 29′ 43″. Postea modo priore: 104336 [illegible]
meter apog. 28′ 30″. Et 95664 est ad 432 [illegible]
Rursum posteriore modo: 106540 est ad 43[illegible]
Denique 93460 est ad 432 ut 100000 ad [illegible]
Collectio ex eclipt. 28′ 30″. 29′ 25″ [illegible]
ex quadrant. 27′ 58″. 29′ [illegible]
(1601 [illegible])

[illegible] ampli [illegible]

[illegible] ejusdem [illegible]

Reiteratio [illegible]

Ponamus, cum Luna est [illegible] tarum ceterorum aequationem [illegible] omnes distantias [illegible] in quadraturis [illegible] vere conficit dista[illegible] metro, mediocres i[illegible] in diametro. Quod [illegible] a diametro, et [illegible]

[illegible]

Et non caret ratione. Nam aliquando aequatum est in □. Ab
m ab epocha post revolutiones integras, quae semper faciunt aequalia,
ordine distantiae locantur in □, et sic fit aequatio 7½. Itaque sint
hic et illic. Et cum hic tempus faciant illius duplum, dupla ita-
tae diametri ad quadraturam? Minime. Nec bene considero, quia non
; sed integrae incitantur. Sint integrae distantiae hic et illic. Et
ciant hic tempus 95, illic 97½, ut ergo 95 ad 97½, sic virtus una
ram. (Hic propemodum apparet utriusque modi aequatio. Illic n.
considero distantias et temporum excessus.) Et ut 2½ ad 95,
cessus virtutis unius ad totam alteram, sed ut 2½ ad 95, sic la-
el ei aequale parallelogrammum) semis ad quadrantem circuli plani.
t triangulum aequatorium ad superpositum sectum quadrantem, sic
excessus ad virtutem alteram. Haec nihil novi habent. In quadran-
rescunt universis 2½, summa universorum est in plano; et planum
r in 92½ sectores et praeterea triangulum, quod itidem valet 2½.
ergo illud planum in 95 sectores. Uni ergo sectori $1\frac{1}{19}$ com-
Quare quilibet sector in diametro $1\frac{1}{19}$ minus temporis habet.
sub anomalia simplici $58\frac{6}{19}$ in diametro volvitur 60. Jam hinc
in octantes quaeratur. Distantiae omnes ordine a diametro in
ad omnes a diametro in quadraturas sunt ut segmentum quadrantis
[illegible]. Sit circulus 31416, erit quadrans BAD 7854, et BAC 3927, radius
[illegible] quadratum 10000, dim. 5000, et △ ACE
[illegible] ab ACD (3927) restat ECD 1427. Haec
[illegible] sionum ad octantem. Jam ergo si sector
[illegible] sunt 360) foeneratur 1 [illegible], quid 1427?
[illegible] prodire.

Fig. 16.



[illegible] apparet, [illegible]
[illegible]
[illegible] ACE 2500, BAC 3927, ergo BAEC [illegible]
[illegible] 16142. [illegible]
[illegible]

[illegible] 87° 28′ [illegible]
ut BAD dividitur [illegible] BAD [illegible]
7854 — [illegible]
= 116¼; 70¼ excessus [illegible] magnus. [illegible]
Videtur dividendum ut quadrantis residuum, [illegible]
(— 14270) = 15012. EDFG = 70711, GCDF [illegible]
ratio quadrupla. Totum ergo in 5 dividitur [illegible]
In progressione arithmetica sic [illegible] summa [illegible]
2 mediarum. Ergo [illegible] est una media, [illegible]
[illegible] hoc 22 [illegible] + [illegible] = 35 + 33; [illegible]
= 38; his propius accedimus. [illegible]

Statueretur itaque virtus cum tempore [illegible]
At hoc absurdum physicis rationibus, quia [illegible]
diametrum redeat. Ergo hoc omnino a [illegible]
visu Lunae.

Non est ergo debilitatio propter tempus [illegible]
tionem a diametro. Et quia elongatio a [illegible]
putanda, ergo arcus digressionis non [illegible]
sed sinus. Sinus autem physice non bene [illegible]
menti, quia stipantur ibi, Luna vero [illegible]
dus quadrans in rectum. Hoc pacto in [illegible]
tantum dimidia esset. Promotio [illegible]

Atque tandem progressio [illegible]
confectus a diametro est [illegible]
radio ☉ fere.

Consideretur vero melius [illegible]
et ultimae 1 [illegible] vel [illegible], eadem est [illegible]
illae aequales fere, [illegible]
octante [illegible] sinus [illegible]
45 × 22½ = 1012½ [illegible]

[illegible]

[illegible] quod ut minimum [illegible] [illegible] ex [illegible] secunda ex Terra, tertia in se. Sed tamen, quia si [illegible] haberet? [illegible] Terra ipsa habet unam rotandi sese, alteram faciendi gyrum apogaei, in [illegible] compensationem Luna non rotat.) Videmur in phaenomenis consen- [illegible] dicturi, si tribuamus diametro sane ut hactenus vim majorem, at [illegible] ☽ a Sole dicamus ita confici aequalibus temporibus, ut distantias [illegible] Mars conficit. Tunc sane suas a Terra eadem vis conficiet. His positis [illegible] sequitur, ab ☍ in octantes augeri distantias a Terra, in quadraturis [illegible] concidere. Nam cito transit ☽ in ☍, vi extrema Solis promota. Parum [illegible] ad Solem accedit, utpote in parvo tempore. Quodsi multum distat, [illegible] movetur. At initio positum cito transire. Falsum igitur. Nisi [illegible] cito transire ratione moduli ex Sole, tarde ratione moduli ex Terra. [illegible] igitur non a sensu, sed ab analogia magis, dicamus, tres illas [illegible] esse in Sole, Terra, Luna; in sola Luna aequabilem, in Terra [illegible] annus variabilem in sese, et variabilem respectu Lunae a Terra [illegible] et descendentis; in Sole variabilem ratione accessus et recessus [illegible] et in apogaeo et in orbe et in ratione diametri. Primae modus est [illegible] 2, tertiae 4 (ut 29 ad 30, ut 8 ad 10). Haec enim [illegible] [illegible]. Sed nihil in tertia videtur considerari debere modus [illegible] tertius nihil, ergo nec primus, nec secundus). Nam [illegible] [illegible] est dupla ad distantiarum circuitum: celeris est enim Luna tam [illegible] in ☌. In secundo vero celeritas illa puto non est animadver- [illegible] (Quare neque tertiae primus?) Considerandum est ergo in tertiae [illegible], quae sit ejus genuina causa. An vere vis in diametro velo- [illegible] est ita quadraturarum retardatio plane non ex Sole, sed ex [illegible] distantia a Terra? Et distantiae variatio ibidem aliunde. At contra [illegible] propius Terram venit, quo [illegible] ejus latitudo. Sed sit illa [illegible] sane aliunde (forte, quod eadem est proportio [illegible] [illegible] hunc excessum, quae orbis Terrae ad orbem Lunae). Jam vide, [illegible] jam pri- [illegible] [illegible] diametro. Nam si [illegible] [illegible], portio eccentricitatis non nisi in proportione [illegible], [illegible]. Nam illud jam pridem sciebam, et si perpendas, ut Tycho [illegible] eccentricitatem in quadraturis, quasi ellipsin tendes a □ in □, [illegible] proportionaliter augens.

[illegible] 54, 60, et [illegible] [illegible] 100000 [illegible] 5° 1′, [illegible] 5° 2′, [illegible]

proportio lunulae ad quadrantem ut 1 ad 12 [illegible] mento, cui adjunctum est parallelogrammum [illegible]

[illegible]

Horarius hypotheseos Tycho[illegible]

Nota, horarium Tychonis prodere [illegible] reddit aequationes quadrantales.

Credibile est igitur, Lunae virtutem esse [illegible] rigat in longitudines medias. Cum igitur [illegible] in quadris, Luna in quadris diu moratur, [illegible] diametro, axis in quadris tendit ad Terram, [illegible] pervasio fit alta.

Et nota, cum jam ante species [illegible] fortes sunt in illo sude et immateriales [illegible] magneticae virtutis in ☉ et ♁ [illegible] specie carbonis exit species lumi[illegible] species motus. At in motu pro [illegible] cus vigor.

Jam considerandum, an [illegible] vigorem [illegible] detur tamen et hoc in hoc casu, ubi [illegible] Nam paulatim crescit utrumque, [illegible] h. e. parum moratur.

Considera et alterum [illegible] parallela est diametro. [illegible] medium [illegible]

[illegible]

□ et □ [illegible]

[illegible]

[illegible] summam, ut aeque valeat haec toti adjumento. Quodsi ergo nihil [illegible] de adjumento in quadraturis, ibi igitur sincera erit virtus solius Telluris. [illegible] accipiendus erit motus horarius in anomalia 90° et quadrato Solis. [illegible] Computetur hic horarius Lunae. Primo propter aequationem sive equationem [illegible] quadrarum in anomalia 90 manet horarius aequalis mediocri. Est vero medio[illegible] 30′ 29″. Jam variatio uni gradui aufert 1′ 26″, ergo huic horario auferet 44″ [illegible]. Itaque horarius quadrarum spoliatus adjumento ex Sole relinquitur 29′ 45″. Quodsi in horas singulas absolveretur de Luna arcus 29′ 45″ aequaliter, in [illegible] 59′ 30″, in 3: 1° 29′ 15″, in 6: 2° 58′ 30″, in 12: 5° 57′, in uno die 11° 54′, tricesima pars orbis, minus ¹/₁₀°. In 30 diebus integer orbis minus 3°. Ergo in 30 d. 6 h. 3′ totus orbis. Nimirum adjuvaret Sol circ. 9° uno mense, [illegible] quarta 2° 15′. Cum autem in una quarta eccentricitas menstrua de 90 possit [illegible] 2° 30′, perparum erit, quod de hoc 2° 15′ retardare possit.

Etsi igitur valet haec hypothesis pro variatione Tychoni dicta, non [illegible] valet pro augmento aequationis, quod ipsum majus est hoc toto.

Neque sana sunt, quae d. 8. Nov. 1601 disputavi, quod centrum [illegible] a centro eccentrici in quadra sit duplo altius. Nam aequantis [illegible] inest in ipso corpore motoris. At concipi mente non potest, qui [illegible] in linea ☉ ♁ versantem, tardius [illegible] incitet, si illa [illegible] velocius perigaeum, si non abstat brevius. Nisi forte [illegible] in ipso corpore Lunae sit in apogaeo versantis alia, quam si [illegible] anomalia; quod incredibile est nec mente concipi potest. [illegible] Lunam insita vi corporis, [illegible] in Terram [illegible] [illegible]rum, valentiorem esse et sic eccentricitatem causari majorem.

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21. Apr. 1610.

[illegible]

[illegible] redirect ad ☉ Luna [illegible]
12 dat 1, quid 360 [illegible] [illegible]

Pone ut natura dederit [illegible] Terrae [illegible]
[illegible] Terrae revolutionibus; [illegible] vero [illegible]
360 dant 12, quid 5¼? — [illegible]/360. Terra [illegible]

in ♀ 5¼. Si 361 dant 78, quid 5¼? — [illegible]
revolutionem sub [illegible] igitur per 68° 2′ 38″ [illegible]

[illegible] 365ᵈ 4ʰ [illegible]

[illegible] reduc ad ☉ [illegible] 12 dant 22, quid [illegible]

[illegible]

[illegible] Terrae gradus non [illegible]
[illegible] Lunam 12ʰ [illegible] Sol [illegible]
[illegible] per 68 gradus [illegible]
Lunam. [illegible] residuum 68° 40′ [illegible]
68. 40′ 14, quid 1 [illegible] 4° 25′ [illegible]
[illegible] 12° [illegible] 21″, [illegible]
[illegible] 4. 12. [illegible] 21 [illegible]

$$\frac{1}{1.\ 12.\ 2.\ 23.\ 21.}$$

Eo igitur tempore, quo et Luna [illegible]
nimirum in 7½ diebus. Horarium [illegible]
in 2 horis gradus esset revolvend[illegible]
revolvitur 1° 1′ 29″, in hora 30′ [illegible]
[illegible]

[illegible] ... in copulis, sed etiam tardum in [illegible].

Consideratio tertiae partis aequationis temporis. Anno 1616.

Cum Tellus interim, dum sub idem fixarum punctum circa Solem restituitur, circa suum axem volvatur 365^{ies} cum quarta paulo amplius (cujus argumentum sunt 6^h $9'$) volvatur vero virtute propria tantum 360^{ies}, reliquae volutiones 5 h. 6. 9' seu horae 126. 9' h. e. 2' 6" 9' sint ex promotione Solari, et varietur haec Solaris promotio cum distantiis Solis a Terra, ut non tanta sit ubi Terra multum distat, quanta est ubi Terra parum distat, sicut ratio distantiarum in promotionum modulis permutetur, et sicut se [illegible] aphelia distantia ad periheliam, sic se habeat perihelius promotionis [illegible] ad aphelium et vicissim (cum ubi tarda promotio, ibi longa mora), [illegible] se habeat mora apogaea in aequali modulo promoti [illegible] ad [illegible] perigeam; promotionis igitur totius, quae facit horas 2' 6" 9', summa [illegible] inter semicirculos anomaliae coaequatae Solis, sicut dividitur [illegible] distantiarum omnium graduum integrorum anomaliae eccentri inter [illegible], respondentes anomaliae coaequatae.

[illegible] distantiarum dictarum summa sic dividitur inter semicirculos ano[illegible] coaequatae, sicut dividitur planum eccentrici a linea per Terram [illegible] [illegible]

[illegible]

Discussa hac objectione jam [illegible] tionem, et corrigimus aut confirmamus [illegible] partium plani composita sit ex proportione [illegible] altera distantiarum. At prius elementum non [illegible] promotionis Solaris, sed auget, posterius vero minuit [illegible] totas 24 horarum prolongat in tempore. Ac cum [illegible] compositae aequalia proxime, sed altera directa, [illegible] valet compensatio, gignens proportionem aequalem [illegible] superioribus quam inferioribus competunt [illegible] 1' 3° 4' 30". Ergo per arcum superiorem [illegible] i. e. h. 3. 0' 48", et h. 1' 3° 4' 30" [illegible] 186. h. 18. 5' 18". At via unitate et [illegible]

360° an. med. : 365. 6. 9. dies = [illegible]

6 : 6. 5. 15. 22. [illegible] = [illegible]

Resp. : 3. 6. 48. 50. 5–58. 15 = 186. h. [illegible]
= 1. 26. 44. 23. 18
Dim. 43. 22. 11. 39.

Revertimur etiam sic ad numeros [illegible] plani pars abundat, detrahimus [illegible] circulo anomaliae coaequatae secundum [illegible] sidera, an hoc fiat recte. Cum [illegible] inter semicirculos anomaliae coaeq., [illegible] supernumerariae eadem proportione [illegible] secundum proportionem [illegible] pars a Sole, tanto etiam plures horas [illegible] Terra in eo [illegible] [illegible]

[illegible] esset, si ut 360 ad 12, sic 5^d h. 6. 9' [illegible] ad [illegible] [illegible] Luna [illegible] ultra 12 revolutiones in anno. At non est [illegible] ad [illegible] [illegible] ad $^{11}/_{30}$ vel [illegible] ad [illegible]. Nam ille amplius duplo est major hoc.

Ergo summa adjumenti Solaris ad volutionem Terrae non causatur [illegible] effectus summam, sed sunt isti duo effectus separati ab invicem [illegible]. Deinde sunt et modis separati motus. Variatio intenditur [illegible] totaliter menstruatim, prout Luna in diametro luminum fuerit, [illegible] incitatio continua est magis, nec nisi parum remittit annuatim: [illegible] causis distinguuntur. Virtutem volvendi corpus proprium Sol con[illegible] in Terra per tenuitatem vel densitatem suae speciei: at virtutem cir[illegible]di Lunam Sol confortat in Terra per figuram illuminationis Terrae, [illegible] per figuram, non per quantitatem circuli, qui insensibiliter variatur: [illegible] neque per fortitudinem vel debilitatem illuminationis. Nam cum variatio [illegible] gradus 182, praestaret igitur in 6 revolutionibus aestivis per 90 [illegible] 30 minus quam dim. 66; quia aequatio eccentri maxima est 1° [illegible]. Eadem n. est proportio quadrantis ad simplam aequationem, quae [illegible] ad duplam; 90 : 66 = 1° 1' 58" : x; 45' 22" 52".

1. 30 : 1. 6,

15 : 11,

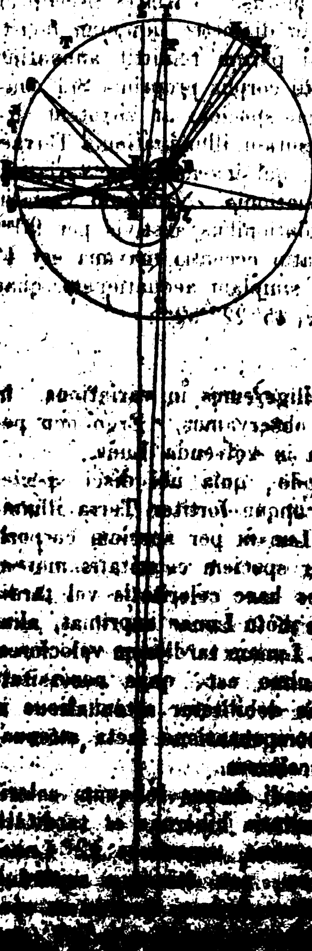
[illegible] eccentri aestivo per 45' 22" minus colligeremus in variatione. Id [illegible] apparet; potius enim per 10" plus observamus. Ergo non per [illegible] illuminationis Sol confortat Terram in volvenda Luna.

[illegible] per figuram confortari patet ex modo, quia ubi disci species [illegible], ibi et confortatio nulla, utcunque fortiter Terra illumi[illegible] unica objectio, si Terra movet Lunam per speciem corporis [illegible] plagam eandem, annon et per speciem celeritatis moveat [illegible]. Non hoc quaero, an species haec celeritatis vel tardi[illegible] motoris, ut ipsam in motu Lunae exprimat, [illegible] Lunam tardiorem velociorem [illegible], materialis mihi species in animo est, quae necessitate [illegible] motu, quae debilitetur attenuatione in [illegible] attenuatione [illegible], compensatione facta attenua[illegible] particulam [illegible] celerem.

[illegible]

300, de eu 17 sint pars, et haec ...
Telluris inaequalitati, itaque tota particula ...
physica, ut maneat 21" 2". (21" 41" : 38 = ...)

Fig. 11.



Sit ...
centrici Lunae in ...
ipsius CB, librato ...
in DC diametro ...
Sit FC ...
trorsum, cujus ...
est sinus totus ...
ad CE, erit ...
trum ...
igitur DC ...
cosinus FE, ...
sequitur ...
ad ...
teria complementi ...
plementi FC ...
angulum DBC ...

Consideratio hujus hypotheseos exactior.

[illegible] Cum [illegible] est apogaea, tunc motu medio esset in N, at propter distantiam [illegible] Solis est in M, et hoc quidem loco promotior. Et cum DBD [illegible] [illegible], erit etiam KDM tantus; sed KDM est hic compl. anomaliae com[illegible] [illegible] quaeritur aequatio MBN. Respondet anomaliae 8° 26′ aequatio [illegible], hic addenda. Et quia ☉ distat ab apogaeo ☽ 210°, scrupula [illegible]dinis superiora sunt 46′ 48″, quae duc dimidiata in 41. 45, prodit 58′ 2″; [illegible] vel DMB est ex composita eccentricitate 58′ 2″, igitur KBM [illegible] 58″.

[illegible] ☽ motu medio parrexerit 8° 26″, veniet in K, et hic non [illegible] aequatione. Nam quantam habuisset aequationem subtrahendam in [illegible] simplici, tantum est promota per elevationem centri ex C in [illegible] Esset autem aequatio subtrahenda paulo minor quam 58′ 2″, ut apparet [illegible], scilicet, quia eccentricitas BC minor, quam BD. Est ergo [illegible], quando ☽ motu medio sit in K. Auferendus sc. est hoc loco [illegible] ab anomalia media, sive ei aequalis KDM. Ergo si fingas centrum [illegible] positum in O, sin illud in D attollitur, Luna erit in K. Per [illegible] vero OCN ex eccentricitate simplici excerpitur COB subtractoria [illegible] 41′ 45″. Itaque BO erit per 41′ 45″ anterius quam CO vel DK. [illegible] Quare qui usurpat OCN h. e. KDM vel KBN pro OBN, ille [illegible], [illegible] 41′ 45″.

[illegible] ☽ in O. Posito igitur centro in C, anomalia PCN [illegible] [illegible] CPB, sed posito centro in D, anomalia non [illegible] sed [illegible] [illegible] aequationem DB [illegible], quantam per eccentricitatem BD [illegible].

[illegible] Linea motus apogaei [illegible] est BCN. Linea motus apo[illegible] [illegible] MDK est [illegible]; MDK est aequatio [illegible] anomalia composita, [illegible] eccentricitas composita, DMB [illegible] Datis igitur [illegible] linea [illegible] ☉ veri, BCN linea [illegible] ☽ medii, [illegible] MDK. CQB aequatio [illegible] BC [illegible] HR, si CH per[illegible] [illegible] BBC, [illegible] et KDR, anomalia [illegible], [illegible] aequatio simplex, sed [illegible] composita DMB [illegible].

consummatur inclinatio borea, cum phasis
Tunc inclinationis planorum sectio eadem
tudinis (i. e. orbita ☽), concentricus ☽ et ecli
At cum phasis prima digreditur a limite borea,
initio tarde remittit (quo naturae principio).
orbitae ☽ in consequentia transponitur (antea
initio additamento, fine item decrescente.

Fig. 12.



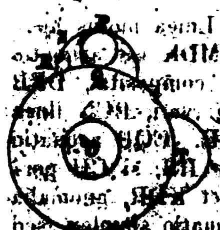
Sit AC
ordinaria, CB
perpetua,
datûrque
phasis
nodi

Cum
☊, ab
in austrum
quam

austrinus, nec austrinus boreus, sed
semper lege parvorum sinuum, quoties
cipiunt.

Triangulum convenit in Pitisco IV.
(pro AB constituitur angulus ex
et quaeritur primo ACB, inde AC

Fig. 13.



Scit quis
mus uti ut plano,
cogita, triangula
igitur

In gradu 45 maximus est cum angulus prosthaphaereticus, tum etiam diversitas inter [illegible] et basin [illegible]. Nam ad 5° addo 9', ergo [illegible] habet [illegible] 5° 9' et 0° 9'.

$$\text{Sec. } 5^{\circ}\ 9' = 100405.325$$
$$\text{Sec. } 9' = 100000.34270$$

100405.325
301
40
27
100405.6687.

Hic secans [illegible] [illegible], ubi maxima differentia.

[illegible] Ut ergo 5° 9' 8" ad totum, ita 0° 9' 0" ad 1° 40' 14". In inferiore sunt [illegible] [illegible] superioribus.

Etsi igitur subtensa seu basis tantulo semper est major, potest tamen [illegible] contemni in computando, et scrupula proportionalia latitudinis possunt [illegible] ex perfecta lege circuli; et quantitas 9' seu 540" distribui [illegible] sinus binorum integrorum graduum.

Hypothesis Lunae mutata. 9. Apr. 1620.

Cum eclipses Lunae (assumta parallaxi apogaea in anomalia soluta a [illegible]) [illegible] quae fuerunt a. 1616 et 1620 videantur [illegible] [illegible] novam in copulis, cogitandum, utrum rationes physicas sic [illegible] [illegible] [illegible], retenta tamen duplici latitudine. Nam ut ab [illegible] [illegible], [illegible] illud velitabimus. Si quis diceret, Lunam [illegible] [illegible] in [illegible], ut [illegible] latitudines simplices, in [illegible] vero [illegible], ut [illegible] 5° apparent 5° 18'; [illegible] 5° [illegible] = 1142905 [illegible] appropinquatio [illegible], ea [illegible] 5° 18' = [illegible] [illegible] [illegible]. [illegible], ut etiam accelerator; in quadris [illegible] est [illegible]. Non [illegible] latitudinis ex appropinquatione, sed est reale ex [illegible] seu [illegible].

[illegible] longitudinem. In schemate (N. 11) sequitur [illegible] noster [illegible] [illegible] [illegible], [illegible] in Ω, [illegible] quidem [illegible]

[illegible]

... simplici, sed duorum respectu ...
partem aequationis, opticam, quatenus ...
aequationis physicae. Sed quae causa, quod ...
corpus, quam super circulum illuminationis? An ...
virium est, quantum Terrae et corpori? Cur ergo ...
quia ponimus eccentricitatem nullam novam fieri? An ...
tus est, incitatio etiam luminis, sane quia per speciem ...
ut et lumen est species? Illa vero tractio est ...
Incitat igitur lumen Telluris, prout vel cavitas ...
in amplitudinem ellipticam et denique circ...
tionem fieri pro ratione phaseos, ut quia in di...
est incitatio, igitur in plena Luna est ...
simplex, in tota igitur obscura dupla. Nam ...
portione, qua duplum, id est linea per totam ...
obstat hoc dicturo, quod, si obscurae vim ...
per igitur cornu obscurum cum gibbo luminoso ...
cum gibbosae facie obscura faciunt totam circulum ...
cati vel luminis vel obscuri conspectus provenit ...
ratione inclinationis circuli illuminationis, plane ...

An idem sit negotium variationis et ...
utilis est, in incrementis quidem, sinus FR ...
HG. Idem etiam circuli illuminationis ...
[illegible]

[illegible] et 20, item 199848 et 152 faciunt 200000. Est igitur merito [illegible] dupla acceleratio defectus Terrae.

15. Apr. 1620.

[illegible] summa sagittarum fiat 20, et qua praestatur in qualitate [illegible], quod per epicyclium Tychonis libratorium, inveniuntur in epistola ad [illegible] hoc mense scripta (vide infra p. 679). In praesens tento ulterius [illegible] variationem cum prosneusi. Nam etsi verum est, variatione [illegible] aestimari vim omnem, qua Sol adjuvat Terram in circumagenda [illegible] ejus quod nunc est, sc. 21 ½°; at nondum divisa est variatio [illegible]. Non enim aestimatur prosneusis vis, seu illuminatio totalis [illegible] toto mense totalis maneret. Sume ob id horarios fictos, [illegible] ab aequatione quadrantum, qui sunt 30′ 14″ et 35′ 57″. [illegible] circumiret in perigaeo, cursum absolveret in 600 ½ horis; si in [illegible] in 714 ⅙ horis viam longiorem. Nam illa ad hanc esset, ut [illegible] ad 104362. Et causa quidem viae longioris in apogaeo circumiret [illegible] horis, itaque debilitatio adjicit 57 horas, quae sunt c. 28°.

Sed erit fortasse facilior consideratio distantiarum. Sicut enim 104362 ad 100000, sic est virtus mediocris ejusque effectus (detracto effectu variationis 10° 44′) sc. 349° 16′ ad virtutem debilem seu ejus effectum 334 ⅞, [illegible] 14° 35′. Si ergo in apogaeo virtute maneret, currens viam concentri- [illegible] in toto mensis modo tempore minus curreret per 14° 35′. [illegible] proportio duplicata distantiarum, ex eo fundamento, quod [illegible] copulatum est dupla physicae qualitatum, atque ut 104362 [illegible], sic virtus mediocris in copula ejusque effectus 360 [illegible] seu ejus effectum [illegible] diff. 25°. Itaque [illegible] in apogaeo [illegible] concentricam mediocrem, tunc in [illegible] tempore [illegible] per 25 [illegible] dimidia 12 ½. [illegible] et [illegible] effectus 346 [illegible] diff. [illegible] 14 ⅓, cujus [illegible] est 21 ½°. Cur ergo debilitatio [illegible] 14 ⅓, [illegible] 21 ½? Considera, [illegible] collectum [illegible] id [illegible] in [illegible] colligitur?

[illegible]

sunt 10 ½. Haec cum ab invicem non ... temperari possint? Primum variationem ... 12 lunationum, atque illa testatur de ... pulis, confirmat etiam proportionem ... ad physicam retardationem in quadris. Cum ... et partes physicae sint pene aequales ... eccentricitas ... Sit enim ... motus variationis ... pro eo ... colligitur ex omnibus variationibus 4 ... etiam in prosthaphaeresis totus col... ponitur, ... 40° 44′, quid ... 32′ 48″ 35‴, sic ... ad ... et quadruplatur ... a 1745.24, quid datur a toto? ...

Quare variatio etiam, ut ... non a toto residuo 132° 45′, sed a toto ... dat 40° 3′ 38″ quid 12 ... 360 ... 25′; 132° 45′ — 124° 25′ ...

Exemplum. Si ...

[illegible] turgido et pleno retardatio in apogaeo aequalis est retardationi [illegible], vel quia 58 synodici respondent periodicis 60, est igitur quin- [illegible] parte minor. Imo nihil hic agis. Nam synodici gradus aequatio [illegible] censenda est in gradibus et minutis synodicis. Igitur gradus unius [illegible] aequatio physica est 2′ 38″, menstrua etiam 2′ 38″, at variatio 2′ [illegible] Tychoni, at ex appendice 132 fit mihi 3′ 34″ 40‴. Igitur physica [illegible] et menstrua teste experientia sunt aequales, at major est variatio. [illegible] major variatio, non igitur omnem incitationem exhaurit eccentricitas [illegible], nec plane duplicat in perigaeo, relinquit enim illic quartam et [illegible] ⁷/₁. Dici sic posset: intervallo quidem medio 100000 etiam [illegible] speciem motricem a lumine, at illi cum augmento vel diminutione [illegible] accrescere compositum quid ex utraque causa, ut sic et Terrae et [illegible] ratione debilitetur vel confirmetur, forte ex aequo, at in mense tur- [illegible] aequationis physicae argui proportionem, quod sc. Sol duas [illegible] Terra unam faciat. Atque hoc est contra illos 132 ⁷/₁₀. Nota: 2. 52 [illegible] 2. 38 ut 11 ad 10. Quia igitur per 2′ 52″ colligimus in anno 106° 22′, [illegible] per 2. 38 colligemus 96° circiter. —

De latitudine Lunae in eclipsibus. 22. Martii 1626.

T. Brahe Progymn. T. I. f. 130. inserto de latitudine ☽ in eclipsibus [illegible] sic: Neque enim opus est longis ambagibus, ut alias, siquidem in pleni- [illegible] prosthaphaeresis nodorum nullam diversitatem inducunt. Hoc idem et [illegible] in computatione eclipsium cum angulo majori [illegible] [illegible] Sed enim prosthaphaeresis nodorum sit Tychoni menstrua, [illegible] [illegible] mihi annua, incipiens ab obviatione ☉ ☊, hinc adeo [illegible] prosthaphaeresin nodorum negligi non posse, [illegible]

[illegible]

Iam igitur [illegible] ... ar ... ss [illegible] jubet (etiam in ipsis [illegible]) ... paeresin nodorum contrari ... e, per 17° 19'. Respondet ... o limitis 17° 10'. In copula ergo ... vero modo [illegible] ... 2 ... ma praeceptum ... erpere angulum 5° 18' ... 1° 29' proportionalis ... et me ... lic ... ctum ad ... per di ... 1° 34' 32" ad unguem idem N ... ... nisi ... vocabulo ... s angulo 5° 3... Cum autem positam, ... est.

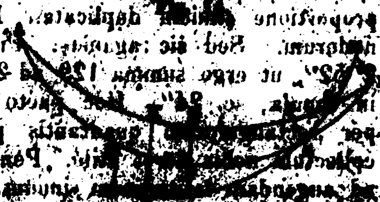
Videmur igitur ingredi ... ere ... per dist. ☽ a ☊ eodem medio, ut ... Nam quod Maginus utitur no... Tychone ... esset ... tu... co ... ita, ... mihi ... ali ...

[illegible] fol. 787 Epitomes. Cum [illegible] angulo [illegible] excurrit in quadras eoque magno, [illegible]
Cum limes in copulis, circulus iterum perfectus, sed [illegible] est [illegible] hos casus circulus non est perfectus. An hoc [illegible] est de [illegible]atione nodi, sed tamen de variatione inclinationis limitum? [illegible] altera jam causa ibi neglecta: quod etiam incipiens egredi a nodo [illegible] parvo, non pervenit tamen ad limitem nisi magno? An hoc Tychonico [illegible]? Sed cum limites fiant 4 simplices, mixtura [illegible] eorum in 2 [illegible] situ differentes, qui sunt quidem inter binos componentes, semper [illegible] majores limitibus eccentrici, cujus major est inclinatio, quam [illegible] [illegible] menstruorum. Itaque inclinationes hae compositae, praeterquam [illegible] ☉ existente, semper sunt minores, quam quod componitur ex 5° 0′ [illegible]atione maxima cujusque mensis. Quo nomine tabula illa latitudinis [illegible] non est utilis. Et hoc est illud, quod manu exstat annotatum ad [illegible] fol. 821. Epitomes. Consistit quippe in hoc aequipollentia cum [illegible] Tychonis, quae in simplici libratione semicirculi menstrui non habet [illegible] Tycho enim prodit inclinationem limitis intermedii.

[illegible] hac igitur resultatione aliquis limitis intermedii dependet etiam [illegible]phaeresis nodi. Nam nodus aequatus quadrante distat a limite [illegible]: est igitur et ipse inter Solem (ejusve oppositum) et nodum [illegible], semper propior nodo medio.

[illegible] igitur inclinatio limitis intermedii cum digressione Solis a nodo [illegible]: hinc jam tandem apparet [illegible], quod [illegible] [illegible]phaeresin nodorum. [illegible] ☉ a nodo 18°, erit [illegible] 17′ [illegible] in limite menstruo (sin. 90° : sin. [illegible] = sin. 72° : sin. [illegible]), [illegible]

[illegible]



[illegible]

Mira res; omnia repraesentat iste [illegible] [illegible]rum tantundem per GD 18', MGD [illegible] [illegible]que modo DM 1° 32' 37". [illegible]

Omnino igitur videtur in copul[illegible] distantiae ☉ a ☊ magnus, at pro[illegible] extra. Imo vide, quid in causa [illegible] exactissimam aequipollentiam cum [illegible] aeque parvam ut Tychonis [illegible] qu[illegible] magnum. Est magnus, at [illegible] solum autem hic calculus, sed [illegible] simplici et menstrua plane aequipo[illegible] est, me extra ordinem magnas [illegible] Eas tamen patiuntur etiamque [illegible] quae et majores vellent latitu[illegible] semidiameter umbrae parva ob [illegible] Solis. Itaque nisi etiam Solares [illegible] causa haec patebit satis clare. [illegible]

Examinatis aliquot Solaribus [illegible] ☉ [illegible] derare magnum [illegible] in octantibus et [illegible] ☽ in ☊ in octantibus versant[illegible] ille augmento [illegible] quae inclinationem [illegible] [illegible] oportet [illegible] [illegible] ☽ per copulas [illegible] [illegible] hoc [illegible] [illegible]

[illegible]

[illegible], ut augmentum fiat majus in copulis, non [illegible] ☽ in ☊ [illegible]? An ingrediemur per dist. ☽ a ☉ amplius, quam per variationem [illegible]? Tunc vitiabimus lat. ☽ in ☊. Nec causa patebit talis augmenti [illegible] ☉ dist. supra verum. Ergo videmur eo redigi, ut prosth. nodi [illegible] menstruam, inclinatione limitis manente annua. Causa est [illegible] in variatione. Nam maxima prosth. nodi est mihi 1° 39′, id est [illegible], [illegible] vero variationis est 81′. Sed variatio ex 5½ appendicibus [illegible] [illegible] est 51, duplum 102, plane aequale huic prosthaphaeresi. Si tamen [illegible] variatio? Imo non est duplicanda, variatio n. est tantum ex[illegible] quadrantis super sectorem. Ac cum quadrans valeat 12[illegible], [illegible] octans erit 64½, adde variationem maximam 40½′, coges 10[illegible], [illegible] 45′, cum prosth. nodi sit mihi 1° 39′ + et Tychoni 1° 48′ +, [illegible] aequalitatem. Ergo Luna per variationem incitata venit ad nodum [illegible] ac si duplo magis per variationem incitaretur, tunc quidem, quando [illegible] in octante, h. e. non incitatur tantum in longum, sed flectit etiam [illegible] in latus utrumque eodem incitationis vigore: si modo vera [illegible] latitudinis in octantibus apud Tychonem.

[illegible] igitur haec nodi reciprocatio sit tantum propter latitudinem ☽ in [illegible], non opus est ipsum menstrua libratione semper aequali aequare; [illegible] a Luna inveniri ibi, ubi est per annuam nostram librationem. [illegible] Luna venit a quadra in copulam, octavo ☊ in octante, [illegible] ex tanta libratione vitium est nullum, quod probo ex eclipsi[illegible] itidem nullum, quia Luna tunc invenit libratam annue. [illegible] primum et post septimum Luna venit in limites, ibi est [illegible], contemptissima tamen [illegible] mutatio latitudinis: et est [illegible]. Nam is Lunam fugit in latus utrumque in eo quadrante [illegible] nodum. Cum igitur est ☽ in □, nodus est [illegible] [illegible], nodus fugit versus Solem, et recedit ab illa, [illegible] versus Solem, ut ipse reverteretur ad locum [illegible] [illegible]. Ergo cum ☽ est ante □ in limite, nodus non fugit [illegible] ubi est per meam librationem annuam, sed e contrario [illegible] [illegible] ☉. Cum igitur observationes eclipsium testentur, [illegible] copulas nullum fieri vitium, oportet neque in [illegible] fieri vitium. [illegible] difficulter [illegible] observabile, cum ob [illegible], quae [illegible] corporis [illegible], tum ob raritatem [illegible], ubi ☽ [illegible] ☊ in octante. [illegible] obviationi ☽ ☊ [illegible]. Atque [illegible] maxima [illegible]; [illegible], ut dictum.

[illegible]

qua Ptolemaeus est usus demonstranda [illegible] subjungenda summa methodi, [illegible]

Postquam Ptolemaeus lib. I. et II. [illegible] demonstrasset, quorum cognitio plane [illegible] jam Lunares motus subjungit, et lib. IV. [illegible] comparatione antiquissimarum observationum [illegible] ☽ primam, suppositione usus epicycli [illegible] ad rem opus [illegible] cognitione aequalium [illegible] anomalia haec ad sequentem investigationem [illegible] necessaria est. Rursum non deficiunt [illegible] vertente, sed tenentur certum orbem, [illegible] ordine redeunt. Ejus orbis investigatio [illegible] Hunc ergo lat. motum Ptolemaeus via directa [illegible] quam et Hipparchus praeivit. [illegible] exempli, atque tamen sum eam ex iis, [illegible] conjicere, quod talis fuerit. Initio Lunae [illegible] quotnam esset scrupulorum. Hoc initium [illegible] hoc caput nobis monstrat. Deinde [illegible] [illegible] hypothesi inaequalitatem demonstravit.

Jam [illegible]

[illegible]

[illegible] detruncum et denique ipsius AE ad 360° [illegible]. In triangulo [illegible] sphaerico AED, rectangulo ad E, datur praeterea latus [illegible] et angulus [illegible] ADE, quare et AD distantia nodi ab opposito loco [illegible], [illegible] elongatio Lunae ab illo nodo, quod erat quaesitum. Atque [illegible] [illegible], qua Ptolemaeus initio fuerat usus.

[illegible] alteram viam insistens in Magna Compositione, regressus [illegible] [illegible] ipsis, quae inter principia assumserat et quae inde deducebantur, [illegible]. Facillime enim error in tam subtili materia contingere potest, [illegible] Hipparchum fefellit, nec plane tanta est Lunae diameter, [illegible] certus est, ut omni dubio careat. Duae enim Lunae [illegible] inaequalitates, quarum quae in coitus [illegible] desinit, admodum [illegible] fuit, ut aliter illam Ptolemaeus tradiderit, aliter Coperni- [illegible] Tycho. Fieri etiam potuit, ut in eclipsibus et morae et digitorum [illegible] non satis diligentiae sit adhibitum. Nam in defectu Lunae [illegible] aestimare quod periit, cum non videatur. Denique latitudinis [illegible] infra dicetur, dubio non caret. Ut jam non dicam de eo, quod [illegible] Lunae, etsi in uno epicycli loco recte fuerit observata, in alio [illegible] vitium contrahat ob [illegible] ab Hipparcho suppositam quanti- [illegible] epicycli, dum inaequalitas omnis ex epicyclo derivatur, quae dimidia [illegible] venit.

[illegible] Ptolemaeus ergo in [illegible] pauciora assumsit et certiora demon- [illegible] latitudinis. Binas eclipses, quam potuit, invenire longissimo [illegible] distantes, elegit sic comparatas, ut utraque esset par- [illegible] quantitatis, apud eundem nodum, in eadem plaga mundi, [illegible] eodem loco epicycli, ut [illegible] [illegible] Ptolemaeus elegit duas partiales eclipses, [illegible] quantitatis, sed alteram [illegible] descendenti [illegible] tempus interjectum [illegible] latitudinis [illegible]

[illegible] deprehendisse, unde latitudinem [illegible]
totum hoc negotium non una ratione [illegible]
Cancro boreum limitem invenitet, fieri non [illegible]
rum orbem potuit; annis scilicet 10. et 11. [illegible]
quidem observationes Ptolemaicae, quantum [illegible]
anno 8. dicti principis, sed praeter unicam [illegible]
sequentes omnino vacui praetermittuntur. [illegible]
3. Antonini cadit. Itaque annis non plus [illegible]
mus tamen tantum his observationibus [illegible]
nodus evehens a 15° ♓ in 15° ♈ moveatur, [illegible]
in Cancrum 18. Inter hos unum tantum [illegible]
partim latent, partim in quadrantem [illegible]
hac nostra tempestate Tycho infallibili [illegible]
dymoris tertia parte gradus amplius [illegible]
latitudine maxima, quam si plenilunium [illegible]
semper deprehenderetur aequalis [illegible]
sit forma motuum Lunarium, cujus [illegible]
Crediderim, non quod [illegible] sed [illegible]
[illegible], adhibitam vero [illegible]
transsumserat. Obsecro enim, quando illud [illegible]
insistens vestigiis priorum [illegible]
[illegible], post illam igitur Lunae [illegible]
h. [illegible] observasse [illegible]
[illegible]
[illegible]

[illegible] metiri. [illegible] aequalis [illegible] Motus latitudinis paulo alius; sit [illegible] ex calculo ante [illegible] item E et D. [illegible] EB in unitate circuli distributione. [illegible] quae est inter BG et GE [illegible] Ptolemaeus [illegible] quare et proportio [illegible] ad EG [illegible] datur et EG semidiameter in unitate dimensione. [illegible] quod antea: si oculi [illegible] sunt perspicaces [illegible] nihil aberrant, et si cetera hujus [illegible] bene habent, methodus utique bona est, quamvis [illegible]

[illegible] qui undique consumit, error [illegible] hodie eadem est, quae [illegible] nihilque habet dubii, angulus [illegible] haec latitudo [illegible]

[illegible]

[illegible] quidem Tycho [illegible]
[illegible]
[illegible] dubitari non [illegible].

Denique non levis momenti [illegible]
usque ad Tychonem, quod [illegible]
epicycli [illegible] essent [illegible] epicycli [illegible]
[illegible] quod epicyclo [illegible]
[illegible] ex [illegible] inaequalitatum [illegible]
[illegible] Etenim cum [illegible]
longius [illegible] celeritas [illegible]
[illegible] discedere lumina et accedere [illegible]
[illegible]
eorum contulerunt, quae dimidia solum illa [illegible]
[illegible] Copernicus [illegible]
[illegible] et [illegible] restituendi [illegible]
[illegible] in [illegible]
[illegible]
[illegible] diversitatem [illegible]
[illegible]
[illegible]
[illegible]
[illegible] considerandi [illegible]
inaequalitate physica, quam putabat [illegible]
[illegible]

[illegible] epicyclo afferre, ad parallaxes examinandas [illegible] in quadraturis non esse [illegible] epicycli [illegible] semidiametrorum Terrae. Cujusmodi quidem [illegible] [illegible] excrescere, cum maxima in quadraturis [illegible] [illegible] itaque jam et in Luna natura nobis argumentum [illegible] introducendae, non minus quam prius in tribus superioribus. [illegible] in theoria Solis quoque probetur, partim Cap. II. dictum, [illegible] Solis diametro agebamus, partim differendum est in partem [illegible] physicam, quam una cum demonstratione motuum stellae Martis [illegible] tempore Deo vitam et vires largiente in lucem dabo, [illegible] motuum causam physicam luculenter et legibus quidem [illegible] ne qua metnas calculo, tractabo. In praesentia tantum dicam [illegible] veteres circa diametros luminarium atque ipsius umbrae in errore [illegible] neglectam hanc physicam causam, nimiaque auctum epicyclum. [illegible] Ptolemaei methodum et quae in illa suspecta sint [illegible] ad hujus quoque libelli methodum accedam.

De mea Methodo.

[illegible] tibi lector traditurus eram [illegible] quale [illegible] appellat [illegible] theoremata et problemata extruendae ex eclipsibus [illegible] nec plane [illegible] quondam Daedalus [illegible] Solis [illegible]

[illegible]

esse studeo; an id [illegible]

ago et pro [illegible]

tibi esse puto declaratione [illegible]

censuram tuam: res enim [illegible]

[illegible] 50000.00 exprimenda erit numero 2 proxime. Denique [illegible] quanta sit proportio 100000.00 et 50000.00 [illegible] ad 1 in ea [illegible], quae minima superius [illegible] respondetur sic: primo si omnes [illegible] numeri ordinis naturalis, semper [illegible] differentia, [illegible]erent eandem quantitatem proportionis, tunc [illegible] inter 100000.00 [illegible] 50000.00 [illegible] 49999.99 numeri, numerus igitur proportionis [illegible]00.00 et 50000.00 esset 50000.00. Sed quia posterior quoque [illegible] quam 1, ergo numerus proportionis [illegible] in suscepta dimen[illegible] 6931472 toties nimirum continetur proportio 100000.00 [illegible] in proportione 100000.00) ad 50000.00, vel 2 : 1. Haec est [illegible] logarithmorum, cui demonstrandae schemate opus non est.

[illegible], quomodo per logarithmos absolvatur multiplicatio. [illegible] ut [illegible]00 ad 90000.00 sic 80000.00 ad 72000.00. (a : b = c : d). [illegible] componitur ex proportionibus [illegible] ex a : b, et ex b : c, [illegible] d. Quare etiam numeratio proportionis a : d seu logarithmus ejus com[illegible] ex logarithmis a : b et b : c et c : d. Atqui proportio c : d est aequalis [illegible] a : b, ergo log. a : d componitur ex 2 log. ipsius a : b et b : c. Sed [illegible] c componunt log. a : c, quia ipsae proportiones a : b [illegible] sunt elementa proportionis a : c. Ergo [illegible] log. a : b (1053605 —) et [illegible] —) componunt log. a : d (3285040 +).

[illegible] demonstrationem perceptam non est, ut amplius dubites, cum logarith[illegible] tibi dantur, vel his uti addendo vel pro iis multiplicando [illegible]

[illegible]

[illegible] logarithmus [illegible] 62° [illegible] 62[illegible] [illegible]

Logarith. [illegible] 40[illegible]

[illegible] Logar. [illegible]

In Meridiano 20. [illegible] ♌

In Nonagesimo 10. 28. ♌ [illegible]

[illegible] 12. 40 [illegible]

Deinde [illegible] 12° 40′ [illegible]

Altit. [illegible] 41. 44

[illegible]

Ang. [illegible] [illegible]

Opinor si [illegible] 41°. 25′ in [illegible] 42°. 28′ [illegible] et hanc [illegible] et verticalis.

Ex his igitur datis [illegible]

☽ 20° [illegible] ♊

Nonag. 10. 28. ♌

[illegible] Logar. [illegible]

Nonag. a vert. 22°. 20′ [illegible]

[illegible]

Omnia consentiunt [illegible] scilicet [illegible] 20° [illegible] defectus, [illegible] et Gringalletus [illegible]

[illegible]

Haec ultima mea emendatio (pro [illegible] quidem) [illegible] potuit [illegible] [illegible], [illegible] haberem quatuor eclipsium [illegible] [illegible] [illegible] et observationibus aliorum doctorum, scilicet Tabiggiae et [illegible] [illegible]. [illegible] parallaxibus assumtis et horariis (etiam a priori) [illegible] [illegible], [illegible] vero angulo latitudinis copulari et loco nodi, ut in Ephemeridibus, [illegible] vero Lunae reali simplici et diametro ☽ in apogaeo [illegible], [illegible] supra votum [illegible] quoad digitos et durationem. In accommodatione temporis adhuc haereo.

Mitto [illegible] loco Theoriam Lunae renovatam. A centrum Terrae, B centrum eccentrici Lunae (qui tamen intelligatur ellipticus, ut sunt eccentrici caeterorum [illegible]), [illegible] linea apsidum, [illegible] linea copulationum, [illegible] circellus respectu copulationum [illegible] in antecedentia, [illegible] [illegible] [illegible] fere in consequentia; lineae ex A [illegible] F, H, E, I, G, K lineae sunt [illegible] [illegible]. Ponamus centrum B in una mense [illegible], [illegible] moveatur [illegible] Q in uno mense [illegible] signum fere. Ducta igitur ex B perpendiculari in EG [illegible] copulationum [illegible] [illegible], punctum [illegible] [illegible] [illegible] quaedam, [illegible] [illegible] [illegible] E [illegible] [illegible] EG [illegible] [illegible] [illegible] [illegible] [illegible] D [illegible] [illegible] [illegible]

Fig. [illegible]



[illegible]

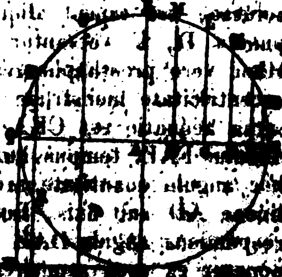
[illegible] est eccentricitas 4362, et [illegible]
[illegible] reperit [illegible]
[illegible] AF linea [illegible]
et DFH [illegible]
[illegible] DFH [illegible] partes [illegible]
[illegible] aequatio, [illegible] habes [illegible]
[illegible] anomalia media, respondens angulo [illegible]
copularum lineis est hic angulus DAF.

Esto [illegible] in K, anguli FAD, DAK [illegible]
DAK media, composita ex [illegible] ADK [illegible]

Esto Luna in I, scilicet [illegible]
strata G, anguli FAD, DAI [illegible]
ejus ad circulum) respondet [illegible]
valor areae ACI. Porro [illegible]
si ad anguli GAK sinum [illegible]
traxeris in [illegible]posito, [illegible]
complementi [illegible] FAD [illegible]
multiplica[illegible]: quas multipli[illegible]
rithmorum.

Variationis calculo [illegible]
est a causis physicis. [illegible]
(sine respectu apogaei), [illegible]
[illegible]

[illegible] aequatio menstrua nulla est, ubicunque [illegible] satis [illegible] intervallo [illegible] aequalis, [illegible] ceteris, vel etiam in ipsa Luna, [illegible] quidem hujus menstruae inaequalitatis [illegible]. VII. [illegible] igitur liberavi hactenus, ut variationis [illegible] ab iisdem causis physicis deduxerant: sed [illegible] alterum ex altero non sequitur, quodlibet [illegible] principio. [illegible] (sic Ptolemaeus appellat) causam in ipsa Luna [illegible] sicut in universum eccentricitatis causae insunt in ipsis globis planetarum, variationis vero causam [illegible] in Terra, Lunae [illegible], utrumque [illegible] secundum illuminationem ejusque phases. Itaque consultum puto, variationem etiam quae menstrua est, a circello BL, qui annuus, removere [illegible] simpliciter affirmare, portiones variationis accrescere [illegible] distantiae Lunae a Sole (seu angulis FAD) in proportione qua sunt [illegible] sinuum distantiae Lunae a [illegible]. Adde demonstrationem [illegible] [illegible]valentiae. Sit [illegible] quadra, [illegible] [illegible] IL, KL, LM, MN partes aequales [illegible] PQ, QR, RS, ST totidem [illegible] ipsi sint NA, [illegible] LC, KD, [illegible] sint [illegible] QY, RX, SW. [illegible] ad BM, dupla [illegible] ad VQ, [illegible] AN ad quadratum [illegible] A, B, C, D, E, F [illegible] in linea [illegible] [illegible] [illegible] BX [illegible]



[illegible]

[illegible] incrementa phasium, [illegible] tempore [illegible]
[illegible] Luna videat Terram gibbam [illegible]
[illegible] (vel tota parte obscura) [illegible]
[illegible] de illa phasi [illegible]
superficie celeritatis. Ita [illegible] quadrata [illegible]

Haec ego, Clarissime Vir, [illegible]
[illegible] de theoria Lunae reformatione [illegible]
partem literarum respondeam; [illegible]
[illegible] ubi [illegible]
[illegible] futurum. Vale. d. 12. Aprilis [illegible]

Tuae Excellentiae [illegible]

[illegible]

Luna igitur versante in linea [illegible]
D vel E (Fig. [illegible]), tunc etsi nulla [illegible]
solutae, tamen aliqua pro[illegible]
puncta D, E versantur extra [illegible]
Hanc vere prosthaphaeresin pro[illegible]
eccentricitate menstruam aequationem [illegible]
[illegible] aequatio est CEA area. [illegible]
[illegible] FAE, tempus huic angulo [illegible]
hoc angulo quantitate areae C[illegible]
lineae AD sub [illegible], luna igitur [illegible]
respondens angulo BAE (duobus [illegible]
[illegible] ex [illegible]
in D apogaeo versante [illegible]

[illegible]

Sit deinde Luna inter duo apogaea vel inter [illegible], ut in L. Hic triangulum solutae est BAL in semicirculo solutae [illegible] et triangulum menstruae est CAL in semicirculo menstruo [illegible], valores [illegible] triangulorum sunt inter se affectionis contrariae, quare hic angulo BAL respondet anomalia media constans ex valore areae DKLA, [illegible] sit valor areae CLA. Hactenus retinuimus distantiam DAB [illegible] [illegible] ab apogaeo Lunae unam et eandem: cum tamen separatio [illegible] [illegible]. Notandum ergo, si apogaeum sit in ☍ vel ☌ ☉, hoc est [illegible] AD et AF, tunc B centrum eccentrici erit in L vel P. Tunc [illegible] [illegible] Luna in H vel K, erit pars aequationis optica, ut hactenus, [illegible] LHA vel LKA: at physica pars aequationis tam solutae quam menstruae communiter est desumenda ex area LHA vel LKA bis sumpta. Quia perpendicularis BC tunc est nulla, quippe absumta in punctum L, ut sic [illegible] triangulum tam solutae quam menstruae eandem habeant [illegible] [illegible]. Vicissim si apogaeum D sit in quadris et angulus DAF rectus, tunc perpendicularis BC cadit in A centrum Terrae, quare eccentricitas [illegible] [illegible] nulla, igitur et aequatio menstrua tunc nulla toto orbitae [illegible]. [illegible] [illegible] efficitur, [illegible] [illegible] ex [illegible] intervallo [illegible] [illegible] circa apogaeum in copulis quam vel in planetis [illegible] vel [illegible] [illegible] Luna circa apogaeum in quadris. Et haec intelligantur de aequa[illegible] ex antiquo cognitis, remota jam variatione Tychonica, de qua [illegible] [illegible] [illegible]. Sed notanda est haec ratio duplex [illegible] [illegible] [illegible] causae motuum physicae [illegible]. Hactenus [illegible]

[illegible]

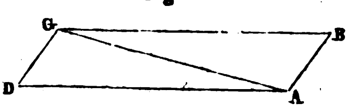
quae secunda est ex menstruis, Tychonis variatio dicta, quae [illegible] vere est plenissima, ipsaque Tychoni dicta [illegible] physica acceleratio et retardatio. Hic aliqua video insignis [illegible] ignorantiae; circa plurima, quae palpitando quaero, adhuc caecutio. [illegible] quidem, ut in Prolegomenis Ephemeridum videre potes Num. XII, [illegible] coepi distribuendam variationem per orbitam Lunae. Primum [illegible] in conjunctione sunt ad se mutuo revolutiones integrae duodecim cum appendice 132° 45', quae accedunt usque ad completionem anni siderei; et tamen haec ipsa appendix 132° 45', in eadem proportione dividenda esse [illegible] gradum distantiae Lunae a Sole [illegible] ut major quidem pars, in anno quidem motu revolutiones Lunae 12 integrae, in uno vero gradu 59' 12 1/6'', causam habeat motricem aequalitatem in se ipsa, puta revolutionem diurnam corporis Telluris, quae per emissam speciem [illegible] Lunam; at minor pars, puta in anno quidem appendix 132° 45', in uno vero gradu residua 1' 47 1/6'' [illegible], habeat motricem [illegible] inaequalitatem, quam statui esse apparentem ipsi Lunae latitudinem [illegible] Telluris. Non disputo jam, an apparentiae optica sit, [illegible] movendi; sufficit mihi, si sit aliqua causa movens, quae [illegible] varietate [illegible] lege et [illegible] 1' 47 1/6'' de [illegible] 90° quadrantis [illegible] deinde [illegible] in illos 90° distribuatur [illegible] scilicet ad sinus distantiae Lunae a Sole [illegible] ab [illegible] [illegible]

quidem totius accelerationis per totum quadrantem jam erat mihi praescripta, eadem scilicet quae hactenus. Itaque quanto augerem accelerationes in copulis, tanto videbam diminutum iri ceteras extra copulas. Sinus ergo primorum graduum digressionis Lunae a copulis non erant magni pro mea mensura, sinus vero circa quadras et finem quadrantis nimis erant magni. At sinus primus et incrementa sequentium sunt index apparitionis latitudinis circuli illuminationis Terrae; non ergo ut evanescit circulus hic illuminationis Terrae in Luna, sic etiam minuitur variationis celeritas, sed magis praecipitatis utitur decrementis, orta a majori quantitate totius.

Coepi igitur circumspicere, quidnam esset hic circulus illuminationis Terrae, qui pro motore constituitur, juxta Terram ipsam inaequaliter movens, juxta moventem aequaliter se ipso (?), et quid consentaneum sit ab hoc circulo illuminationis moveri. Nam si eadem est Terra, quae movet duplici respectu, et ratione sui corporis diurno motu rotati et ratione suae illuminationis, eodem modo et de Lunae corpore dicendum esse videbatur, ut eadem esset Luna quae moveretur duplici respectu, et in quantum est solidum in coelo corpus, et in quantum et ipsa illuminatur a Sole. De hujus rei possibilitate et modis et de τῳ διοτι disputent metaphysici, mihi ut supra dictum mensurae motuum tales, quae appareant in rerum natura, ad investigandum sunt propositae et το ὁτι. Itaque divisim etiam. Telluris quidem rotatae species, ut solidi corporis, aequabili suarum virium contentione movet Lunae corpus, ut corpus, modificantibus tamen intervallis ut in planetis ceteris: at ejusdem Telluris corpus uti figuratum varie habet adspectum illuminationis suae versus Lunam porrectum, movet ejusdem Lunae corpus, uti et ipsum varie figuratum habet illuminationis suae adspectum versus Terram porrectum. Movet itaque apparens latitudo circulum illuminationis, et quantum ipsa habet in se latitudinis apparentis et quantum ejus invenit in Luna quovis tempore. Atqui eadem sunt incrementa phasium utrarumque: ut quo tempore Terra videt Lunam falcatam, eodem Luna videat Terram gibbosam, ut ita circuli illuminationis diametri latitudinum sint semper paralleli, et ejusdem ex inclinatione quantitatis apparentis, in comparatione ad cujusque recte objectae visionem quasi totalem. Ergo non est distribuendum illud auctarium 132° 45′ super 12 Lunae revolutiones integras, non est, inquam, distribuendum secundum mensuram simplicis hujus latitudinis ellipseos seu circuli illuminationis apparentis, sed oportet illam bis adhibere: hoc est, ut geometrice rem eloquar, non incrementa ipsorum sinuum digressionis Lunae ab oppositione vel conjunctione Solis, ut hactenus, sed incrementa quadratorum sinuum debent statui pro mensura accelerationis hujus in copulis.

Porro ut revertar ad initium, talis nascitur forma hujus calculi, ex qua luculentissime appareat, tam variationem Tychonis quam προσνευσιν Ptolemaei ex eodem esse fonte. Nam esto in adjecto schemate A centrum Terrae, AB semidiameter illuminationis Terrae, G centrum Lunae, GD semidiameter illuminationis Lunae. Si ergo semper GD et AB parallelae quam proxime, et si sinus GAD multiplicatus in sinum AGB facit numerum, qui metitur quantitatem seu vigorem accelerationis competentem in tali situ, sic ut factus iste sit maximus in copulis, nihil in quadris: facile apparet, si jam etiam prolongentur lineae AD, BG, per eccentricitatis interventum angulos

Fig. 18.



[illegible] [illegible] [illegible] ac [illegible] accelerationes [illegible] [illegible] [illegible] ([illegible] [illegible] [illegible]), in quo [illegible] apogaeum Lunae [illegible] [illegible] supra in schemate 16. [illegible] nobis punctum C [illegible] [illegible] [illegible] eccentricitas AC.

Et haec sunt, quae ad hoc usque tempus in lucem [illegible] [illegible] in quantitate utriusque rei concilianda etiamnum haereo. Nam [illegible] [illegible] [illegible] ab eodem fonte, prosneusis quidem Ptolemaei effectum [illegible] [illegible] (quando apogaeum Lunae est in copulis, Luna ipsa in [illegible]) 2° 20′, ex hac vero quantitate nascitur jam aliqua etiam variationis quantitas necessaria, sed quae nonnullis scrupulis (non tamen valde multis) [illegible] tam a maxima variatione Tychonica, quam ab ea quantitate, quam [illegible] [illegible] calculus et assumtio [illegible] illius 132° 45′ ad 12 revolutiones in uno anno. Quare vitandae perplexitatis causa [illegible] hic [illegible] super causa utriusque physica, et me convertam ad demonstrationem calculi, [illegible] habet aliquot [illegible] theoremata et [illegible] [illegible]. [illegible] [illegible] facta de gradibus singulis distantiae Lunae a Sole [illegible] [illegible] iis accrescere dico accelerationis proportionem [illegible] [illegible] [illegible] in ea proportione, quam servant [illegible] [illegible] distantiae [illegible] [illegible] [illegible] [illegible] accelerationis vigor est in copulis [illegible] [illegible] [illegible] distantiae [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] Porro quod hic dico [illegible] [illegible] [illegible] [illegible]

[illegible]



[illegible]

multo est majus summa quadratorum ex omnibus suis partibus. Hic igitur commoda admodum nobis accidit aequipollentia inter NA, MB &c. et inter AB, BC &c. Quia enim indigemus ipsorum NA, MB quadratis, non per se, sed ob mutuam eorum proportionem: hic nobis subsidio venit Justus Byrgius, proportionem horum quadratorum exponens in lineis rectis. Sit enim in continuato quadrantis nostri circulo semicirculus NQT, divisus in partes numero aequales partibus quadrantis NG aequalibus, quantitate vero duplas illarum; et sint arcuum semicirculi sagittae ut hic ordine videre est.

Arcus quadrantis	GH	GI	GK	GL	GM	GN	ut horum quadrata inter se:
Sinus	HF	IE	KD	LC	MB	NA	
Dupli arcus	TS	TR	TQ	TP	TO	TN	sic hae lineae inter se.
Sagittae	SV	RX	QY	PX	OV	NT	

Jam vero binae sagittae OV et SV aequant diametrum circuli, sic etiam PX, RX. Quare pro quadratis AN et GG (hoc analogice appello quadratum) sumitur diameter NT, pro quadratis BM, FH diameter alia, pro quadratis CL, EI tertia, denique pro quadrato DK semidiameter YQ. Itaque si, quot sunt partium aequalium quadrantis termini, tot constituam semidiametrorum summam, habeo summam quadratorum omnium sinuum ad illas partes. Et quia terminorum semper uno plus est, quam partium: ideo sciendum est, quo magis minutae multaeque fiunt unius quadrantis partes, hoc magis terminum hunc supernumerarium evanescere. Itaque pro 90 partibus quadrantis 90 semidiametri sumtae quam proxime constituunt summam omnium quadratorum. Reliquorum arcuum summae colligendae sunt ex continua additione secantium, ut sciatur quantitas effectus in uno quolibet arcu distantiae Lunae a Sole vel ☍ ☉. Hoc itaque pacto fit, ut accelerationem in copulis repraesentet linea NT, et accelerationem in quadris linea 0 seu nulla. Cum itaque pro primo et pro ultimo gradu quadrantis distantiae Lunae a Sole sumatur linea NT diameter, sit vero de summa omnium sagittarum pars quadragesima quinta: erit igitur valor ejus de summa accelerationis quadranti debita tantus 3′ 34²/₅″. Haec est acceleratio in primo gradu distantiae Lunae a Sole vel ☍. Adde hanc ad modulum virtuti motrici Telluris aequabili debitum, scilicet ad 58′ 12²/₅″, conficitur 61′ 47¹/₅″. Est enim acceleratio 3′ 34²/₅″ praecise dupla diminutionis, quae ad hujus calculi formam est necessaria tam in vitiosa quam in emendata forma. Itaque hic in 1° distantiae Lunae a Sole variatio est 1′ 47¹/₅″ addenda. Contra in quadris et gradu proximo pro duobus gradibus, uno in copulis et uno in quadris, valet linea NT: illam vero totam vindicat gradus copularum, ut ita nihil relinquatur gradui in quadris. Si gradui in quadris, pro diminutione, quam est passus eandem cum ceteris quadrantis gradibus, nihil vicissim accedit: ergo is manet diminutus, scilicet 58′ 12²/₅″. Ergo variatio competens circa quadras est 1′ 47¹/₅″ subtrahenda. Erat vero in copulis ejusdem quantitatis addenda. Est igitur inopinata aequipollentia mera inter hanc meam ad physicas causas accommodatam calculi formam, interque Tychonicam calculi formam circelli, cujus motus duplo celerior est digressione Lunae a Sole. Dici non potest, quam valde me exhilaraverit inopinatus hic exitus calculi et demonstratio, quod etiam Tychonis circellus cum suo motu duplici contra quam hactenus credideram causis nitatur physicis. Nam circellum ipsum

[illegible] esse, sed [illegible] physicas. [illegible] et [illegible] tres [illegible] physicarum causarum: prima, quod [illegible] quadiametro [illegible] orbitam, non vero circumit in circumferentia [illegible] circelli motus est inaequalis, tardus in apogaeo eccentrici [illegible] velox in perigaeo; tertia, quod diameter ejus deberet augeri et minui, [illegible] esset. Nam semper apparet 40′ 30″, sive remota sit in apogaeo, [illegible] propinqua in perigaeo. Demonstratur autem aequipollentia sic, quia gradus singuli apud me sunt diminuti quantitate 1′ 47 $\frac{1}{2}$″, maximum vero [illegible] accelerationis est hujus duplum, scilicet 3′ 34 $\frac{1}{2}$″, et hoc [illegible] lineae NT. Tycho vicissim non diminuit gradus, [illegible] quantum indicant NT, SV, [illegible] AT, SV, id est quantum [illegible] NR, OS &c. Atqui [illegible] NA, OS, ut prius dictum, [illegible] in sinibus AE, AF, AG, haec igitur est semidiameter libratoria Tychonis, ut Luna in copulis sit in A, in octante vero in G, in quibus [illegible] in A, quia idem est, [illegible] post octantem [illegible] motum initio [illegible], ego augeam initio diminutum. Ceterum hoc adhuc desidero [illegible] calculo, ut supra etiam dixi, quod, si quantitatem Tychonis 40 $\frac{1}{2}$′ [illegible], tunc neque plane eum concilio cum quantitate προσνεύσεως Ptole-[illegible], neque in uno anno conficio 132° 45′, quanta sc. est appendix ad [illegible] 12; et vicissim si conficio 132° 45′, tunc variatio maxima [illegible] non 40 $\frac{1}{2}$, ut Tychoni, sed plane 51′, ubi plus excedo Tychonem, [illegible] priori vitiosa forma calculi defeceram. Etsi neque observata [illegible] semper modulum 40 $\frac{1}{2}$′ exprimunt, sed interdum etiam 46′. Tunc [illegible] mihi [illegible] in eclipsibus per magnam meam variationem: [illegible] percommode mihi accidit, ne nimiae mihi, ut solebant, prodeant [illegible] et morae.

[illegible], clarissime Vir, potius [illegible] mei, quam tui [illegible] [illegible]

[illegible]

finxisse puto in gratiam meae observationis. Jam vero utraque circa perigaeum fuit, haec ante, illa post. Differentia anomaliarum est 17° circiter. Quodsi perigaeum penitus mediasset inter utramque anomaliam, summa prosthaphaereseon non potuit esse major quam 1° 34′. At si altera fiat perigaeo propior, minor paulo erit summa. Jam vero non potest valde magnus error esse in distantia locorum Solis in utraque eclipsi. I nunc, et aequa more Tychonico seu meo, seu etiam nulla utere aequatione, nulla ratione efficies, ut Luna his Solis locis opponatur ad observata tempora, nisi valde magno aliquo mutes eccentricitatem Lunae et prosthaphaereses. Quasi omnino aliquid loco Solis acciderit anno 1619. 6. Dec., ut qui nec Lunae motibus, nec fixis accommodat centrum umbrae. Vides omnibus astronomis etiam atque etiam cogitandum de hac eclipsi anni 1619. Qua adhortatione finiam. Vale. Scripsi 12. Apr., rescripsi 28. Maj. 1620. Lincii. Addideram multa politica, sed illa Deo et politicis curae sunto; nos ut mones precibus nisi, Deo confisi nostra agamus.

Transformatio Hypotheseos et Tabularum Lunarium Tychonis Brahe.

Praemissis disquisitionibus Kepleri de Luna et [illegible] [illegible], subjungendam censemus partem opusculi, quod Keplerus [illegible] [illegible] mandandum sibi proposuit, diversis vero causis [illegible]. [illegible] Herwarti Keplerique epistolis [illegible] pertinentia.

Herwartus d. 2. Dec. 1604. scripsit Keplero: [illegible] [illegible] ich dem Herrn zu verstehen, dass mir Tycho Brahe [illegible] gemacht, dass er mir seine rationem calculi Eclipsium Solis et Lunae [illegible] mir darauf schon I. Partem Progymnasmatum [illegible] [illegible] öffentlich publiciert werden sollt) [illegible] 1601. Jahrs seine Meinung de motu Lunae, so er „De [illegible] Lunae [illegible] et hinc deducta numeros" intitulirt, [illegible] [illegible] parallaxium Solis et Lunae. [illegible] die Fehle angesetzt, hab ich befunden, dass [illegible] in calculo mediorum motuum [illegible] [illegible] und ungleich [illegible] [illegible]

[illegible] 22° [illegible] deficit digitis [illegible]

[illegible] 7. 58".

[illegible]

eclipticae variationem, also dass mich dünkt, man könnte ex his datis eclipses wohl calculiren. Die jüngste geweste eclipsis Solis ist hie nit gesehen worden, dann es gar neblich gewest, sed obscuratio videtur circa quartam p. m. incidisse.

Damit was dem Herrn von mir jeder Zeit lieb und angenehm ist; und bleib dem Herrn angenehme Dienst zu erweisen, neben Wünschung eines eingehenden und vielfolgend glückselig Jar ganz willig und geneigt.

Datum München d. 30. Dec. 1601.

Ineunte anno 1602. transmisit Keplerus Herwarto promissum calculum; Herwartus, gratias agens, rescribit (sine die): Hab gern vernommen, dass der Herr es für räthlich achtet, die defectus luminarium circa Christi tempora nachzurechnen, besonders weil wir kein eclipsin Solis haben, die so alt sey, und ab astronomo aliquo observirt, auch wie sie observirt sey, beschrieben worden. Wie auch im Ptolemaeo keine loco exempli beschrieben ist; sondern ich hab auch ex suis datis et assumtis etliche eclipses Solis circa illa tempora calculirt und befunden, dass sie, und zwar auch fürnemlich ratione parallaxium Lunae ex traditis Ptolemaei assumtarum, bei weitem den traditionibus autorum nit zugetroffen. So kann ich die observationes und calculum Tychonis auch dahin nit bringen, dass sie den traditionibus autorum correspondirten. Aber den calculum Prutenicum e fontibus Copernici finde ich trefflich mit den traditionibus autorum correspondiren. Allein dünkt mich, dass je weilen eine eclipsis grösser gewesen, als dieser calculus exhibirt.

Ad haec Keplerus bis rescripsit, calculum forte promissum eclipsium absolvens; e literis vero Herwarti per aestatem anni 1602, in quibus gratias agit pro transmissis calculis aliaque plura tangit (comp. Vol. II. p. 755. III, 28), nil de proposita emendatione theoriae Tychonicae deprehendimus. Ultimo vero die Julii adit Herwartus „Joh. Maenhardum, R. Kais. Mt. Lateinischer Canzley Registratorem" quaerens: Nachdem ich nit weiss, wo sich anjetzo M. J. Kepler, I. M. Mathematikus, so sich ein Zeit lang bei weiland Tycho Brahe aufgehalten, und bei dessen Erben zu erkundigen, aufhalte oder anzutreffen seyn möchte, als Bitt ich Euch freundlich, Ir wöllet mir so viel zu Gefallen erweisen, und Ime diess inliegend Schreiben zuordnen. Und bleib ich &c.

In literis his subjunctis monet Herwartus, ut Keplerus colligat Tychonis observationes illasque emendet. Deinde, accepta Kepleri responsione, Herwartus (d. 24. Sept.) praemissis adhortationibus, ut evitet discordias cum Tychonis haeredibus, censet emendandum esse motum Solis et Lunae adhibitis veterum auctorum de eclipsibus relationibus additque: Und wollt ich gern wissen, wann einer visa loca ☉ et ☽ hoc seculo exacte praediciren, auch eadem methodo eclipses luminarium ex autoribus praeteritorum temporum salviren kann, was doch ime abgehen solte, in diesen Sachen nit allein quoad futura certitudinaliter quoad fieri potest zu praediciren, sondern auch de praeteritis observationibus fundamentaliter zu judiciren.

Der Herr hat mir Ursach zu dieser Anregung geben, indem er mir eine quaestionem chronologicam proponirt.

Aera obitus Alexandri in Ptolemaeo et praesertim Theone ante Ch. annis Aeg.

323.	d. 130.	inde ab Epocha Christi deinceps
883.	„ 116. 53′ 45″	ad aequin. autumnale Albategnii
1206	anni Aegypt. 246. 53′ 45″ dies.	

At ante Epocham Christi 81 et post Ep. Ch. 220 dies in hoc spatio intermedio intercalantur, qui conflant d. 301 intercalares, atque consequenter hoc tempus aequinoctii autumnalis ab Albategnio observati incidit ante exactum annum ab epocha mortis Alexandri 1206 Julianam (non Aegypt.). Consimiliter et in fortioribus terminis: ab epocha mortis Alexandri praedictorum ad plenilunium Albategnii d. 23. Jul. 883. Ch. observatum, sunt intermedii anni Aeg. 1206. d. 189. 14′ 40″. Sed in hoc spatio intermedio ante ep. Ch. 81 et post 220, qui conflant 301 dies intercalares, sunt elapsi, ideoque id ipsum quoque plenilunium merito intra annum a morte Alexandri 1206 collocat, Julianum videlicet. Ego vero hac ipsa in re majorem difficultatem invenio in Tab. Alphonsinis, ubi prope 8 ep. Ch. signatur in meridie currentis ultimi diei Decembris. Et tamen ante eam usque ad initium regni Alex. M. habet annos Aeg. 323, d. 131 integros. Ille etiam epocham ipsam Nabonassari integra die anticipat citiusque ponit, quam Ptolemaeus et Theon et Regiomontanus in Epit. lib. 3. prop. 21. eandem collocat. Refert quidem P. Nonius, Regiomontanum hoc intermedio spatio diem unum Alphonso demere, atque post epocham Ch. usque ad aequinoctium Antonini eandem restituere. Sed non animadvertit, hanc injuriam non tam Alphonso, quam Ptolemaeo, Theoni et observationibus ipsorum contingere.

Quid de observationibus Ptolemaei dicendum, siquidem observationem Agrippae ☌ Lunae et Plejadum d. 29. Nov. a. Ch. 92. optime sane collocat in annum Domitiani 12? At vero observ. Menelai ☌ Lunae et spicae d. 11. Jan. 98. habitam adscribit anno 1. Trajani, cum tamen eo tempore adhuc vixerit Nerva, qui Trajanum pro consorte imperii sibi arrogavit.

Sed sit id ferendum, quoniam tum re vera Trajanus una cum Nerva [illegible]. Quid [illegible] reliquis observationibus omnibus ab ipso Ptolemaeo [illegible] [illegible] observavit 25. Sept. a. Ch. 132. idque lib. [illegible] [illegible] 17. Adriani, cum contigerit anno ejusdem 16. Et Lunae defectum [illegible] [illegible] Adriani 17. eidem, qui ejusdem 16. evenit; defectus ☽ 20. Oct. a. 134. [illegible] Adriani pro 18. Sic Ptolemaeus observavit ♀ 16. Dec. 138, et libro X. cap. [illegible] [illegible] assignat anno II. Antonini, cum Idib. Jul. proxime praecedentibus [illegible] [illegible] ejusdem anni. Observavit 26. Sept. 139. aequinoctium autumni. et [illegible] [illegible] utrumque observavit currente anno 2. Antonini, cum [illegible] [illegible] anno 3. ejusdem, adeo ut omnes observationes Ptolemaei uno anno [illegible] [illegible] ab ipsissimo earum authore inscribantur.

[illegible] hanc difficultatem evitare H. Buntingus, ut contra autoritatem [illegible] [illegible] medio tollendum censuerit consulatum Severiani 2. et [illegible] Augurini, qui a. [illegible] [illegible] fuere. Will des Herrn Bedenken rationé eclipsium [illegible] temporum [illegible] annehmen.

[illegible] mir zu Gemüth, wie es komme, dass der Herr die differentiam ratione temporis [illegible] Alexandri M. zwischen Ptolemaeus und Albategnius so fest [illegible], und [illegible], [illegible] Ptolemaeus seine Sachen a Chaldaeis, und die Chaldaeer [illegible] [illegible] Alexandri M. ante Ch. 312. designata vel 311. [illegible]. Dices [illegible] [illegible] esse absurdam; sed considera, Ptolemaeum et Hipparchum [illegible] ex Chaldaeis [illegible]; deinde contemplare quaeso Livium, ubi de Perseo, ultimo Macedonum rege [illegible] [illegible] Macedonicum a summo fastigio usque ad interitum solis 150 annis [illegible]. [illegible] juxta Chaldaeos a. a. Ch. 311. Alex. M. Babyloniam [illegible] [illegible] tempore mortis illius, quod Judaei quoque anno a. Ch. 310 [illegible] [illegible] remanebit utique annus a. Ch. 160. quo contigit eclipsis ☽, quam [illegible] [illegible] totalem characterem ratione temporis et durationis [illegible] [illegible] adeo ne vix quidem aliquis queat.

[illegible] in Eil &c.

[illegible] &c.

[illegible] respondit (d. 7. Oct. 1662. Comp. Vol. II. p. 77. 755, et III. [illegible]) [illegible] ipse herteris, ut concordes [illegible] [illegible] [illegible] accesserunt, ab ipsis (Babrodilpus [illegible]) [illegible] [illegible] petere cupiam. [illegible]

[illegible]

Ptolemaeus illud aequinoctium autumnale, quod contigit 32. tertiae Calippicae, die 2. Epagomenon, conferat in 178. mortis Alexandri, cum tamen ad complendum 177 ab epocha 12. Nov. superessent duo pene dies. Nec potest dici, vernale praecessisse. Nam quia anni Calippici incipiunt a solstitio, in eo igitur anno praecedit autumnale: utrumque autem assignat eidem 32. anno. Hoc unum est. Deinde si haec ita habeant, equidem Albategnius in intervallo inter Ptolemaeum et se erraverit. Ptolemaeus enim annum Nabonassari tradit, Albategnius Julianum seu tropicum intelligit. Quos igitur ille 743 computat, illi re vera 744 sunt. Id enim animadvertens Buntingus nescio quid dicit. Sed ex ejus computationibus (qua re mihi pergratus est) apparet, Reinholdum Albategnio vim fecisse, quasi 1206 et 1194 intelligendi essent hoc loco de Aegyptiis: cum tamen eo ipso anno Juliano non Aegyptiaco eclipsin collocet: quae character est irrefutabilis. Haec mea ratiocinia si admittenda censes, possunt in futurum esse utilia. Anni tamen quantitas non multo prodit alia. Albategnius enim habet h. 5. 46′ 24″; correctus h. 5. 45′ 56″, adhuc brevior per 28″ horae.

De aeris Alphonsi gratias ago quod monuisti. Nam in iis tabulis parum versatus sum, cum id non ferat usus; illud a Tychone solum audivi, consulendas olim illas, quae aequinoctium praebeant suo Alphonsi tempore; non se dubitare, quin aequinoctium observaverint eique tabulas superstruxerint. De cetero non multa facta est earum mentio. Leovitius nobis vicem earum supplevit ut plurimum. Illud in genere monuit Reinholdus, fine canonum aeras Alphonsi a vera historia multis in partibus plurimum discrepare.

Ceterum in sequentibus ridiculum mihi negotium exhibet Magnitudo Tua, dum me jubet principia defendere. Scilicet omnes Ptolemaei et Chaldaeorum observationes erunt dubiae, si eviceris, quosdam historicos annos regum sub quibus observarunt aliter numerare. Scio, non te ita sentire, sed mei tentandi gratia scribere; sed quia responsum urges, parendum est tanquam in re seria. Dicam primum pro astronomia, deinde pro historiis. Quamquam pro astronomia supra dixi, cum illam tuam dubitationem de antiquissimis monarchis ante Alexandrum tangerem.

Hic jam multo aequiorem habeo causam. Supra de magno aliquo annorum numero lis erat, jam de uno anno imperii Adriani, Trajani, Antonini, Domitiani, et ad summum de biennio in annis mortis Alexandri agitur. Nihil haec disceptatiuncula facit ad incertas faciendas observationes. Observationes in universum hae sunt: aequinoctii, Mercurii, Veneris, Lunae, eclipsium. Sic definiendo aequinoctii anno Ptolemaeus mentionem Principis Romani potuit omittere; sufficit ut indicaverit connexionem cum periodo Calippica. In hac connexione falsus non fuit. Eadem enim Luna, quae Calippo suas periodos, Ptolemaeo suam a Calippicis distantiam patefecit. Nec difficile caput invenire periodi: non quotannis novilunium in 1° ♋ incidit. In Venere et Mercurio, si error in annorum illic 8, hic 13 summa committatur, tantum observatio aberravit, quantum planeta ad summum biduo conficit. Nam post 8 annos Venus, post 13 Mercurius propemodum eodem revolvuntur. At tu praesupponis unius saltem anni aut summum biennii errorem. Quare impossibile est, si annus observationis adulteretur, ut non tanta sit dissonantia observationis cum coelestibus motibus, vulgariter saltem et crassa Minerva cognitis, quantam vel coecus palpare possit. Adde quod neutra harum observationum solitarie ponitur, sed illi locus certus

in annis Nabonassari (seu [illegible]) [illegible]
[illegible] locum [illegible] temporis [illegible]
[illegible] aetate Timocharidis conscriptam [illegible]
[illegible] Denique utraque per Lunae [illegible]
[illegible] Ita enim et intra 10° vel 12° [illegible] vicinitatem Lunae et
Veneris aut Lunae et Mercurii conjunctionem [illegible] quae [illegible]
[illegible] mensis Aegyptii expressa [illegible] intra non duos vel tres [illegible]
[illegible] inventu alium, quam est ea quam Ptolemaeus annotavit. [illegible]
[illegible] opus est? Quando enim [illegible] hoc animadversum est,
[illegible] exacto [illegible] vel Juliano vel Aegyptio [illegible] eodem [illegible]
[illegible] in eodem gradu vel signi decimo, sed [illegible] in eodem
[illegible] tempore in suscepto temporis principio [illegible]
[illegible] hora [illegible] die mensis certi et loco Lunae [illegible]
[illegible] vel duobus annis. [illegible]
[illegible] vel certe [illegible]. De eclipsibus [illegible]
[illegible] quae non quocunque [illegible]
[illegible] quidem [illegible] observationi [illegible]
[illegible]
[illegible] Ptolemaei [illegible]
[illegible] Imperatorum, tamen observationes manent in [illegible]
[illegible] recenset [illegible]
[illegible], qui de historiis pauca [illegible] enim est [illegible]
[illegible] Ptolemaeus [illegible]
[illegible]

numeret Ptolemaeus ab Alexandro in observationibus aequinoctiorum, cum pleraque hauserit a Chaldaeis errantibus. Non sum contentus, multo minus quam prius. Si erravit, cur ergo uterque superius ipsum conciliavimus, quasi Aegyptiacos annos a 12. Novembris mortem Alex. antecedente usurpantem. Deinde aequinoctia non a Chaldaeis sed Hipparcho sumit. Nihil igitur huc facit Chaldaeorum error.

Denique epistolam M. Tua claudit propugnatione eclipsis in clade Persei a se inventae, quae septennio abest a clade Persei. Ex errore Chaldaeorum et crassa computatione Livii, duabus scilicet egregiis partibus, unum totum conflat, cladem Persei 7 annis a vero aberrantem. Characterem putas irrefutabilem 150 annos imperii Persici. Imo refutatur contrario irrefutabili charactere, quod illa eclipsis in hiemem incidit, cum vera et Persei clades contigerit circa solstitium, ut superioribus paginis scripseram. Quin potius ad annum ante Christum 167. addimus illos 150 Livii, quia ex eclipsi constat, Perseum victum anno 167: nec fasti consulares inde a 6. Augusto retro continuati ultra unum annum ab hac computatione abeunt, quibus te hic quoque in summa 6, 7 vel 8 annorum fidem adhibere par est, cum ipsis infra de unico anno contra Ptolemaeum *αὐτοπτῃ* credideris. Ergo additi 150 ad 167 faciunt 317, quo anno regnum Macedoniae, interfecto Philippo Arrhidaeo, ad aliam stirpem transiit, Cassandro succedente. An hic quicquam contra Livium? recenset per partes fortunam ejus regni: seorsim antiquissimos reges, seorsim bella civilia successorum, qui ad incerti dominatus certi ex Alexandri gente haeredes fuere: ubi primum Cassandro confirmatum Macedoniae regnum, et occisus Arrhidaeus, ab eo summo fastigio ad ultimum finem annos 150 numerat. Si non placet seorsim commemorata bella civilia, sed inclusa summae annorum CL, quod forte ex textus inspectione dices: ergo aut mecum fateare, Livium crassiori calculo summaria numerorum consectari omissis minutiis, aut hanc Persei cladem non jam septem annis justo propius Christo admoveas, sed aliis septem annis longius a Christo in antecedentia retrahas. Exspecto utrum velis. An tu putas, summum fastigium regni Macedonici in morte Alexandri fuisse? minime proprie. Fuit is multorum regnorum dominus et monarcha, successorem in Monarchia nominetenus habens jam fratrem, jam filios. Ab eorum exstirpatione demum seorsim de regno Macedonico judicamus. Nisi hoc fiat, non poterimus Macedonum potestatem in clade Persei terminare: superstitibus in Asia Eumene, in Syria Antiochis, in Aegypto Ptolemaeicis, Macedonibus.

Sed enim satis feci verborum. Rogo majorem in modum ut Magnitudo Tua mihi libertatem hanc disputandi, quam provocationibus suis auget, in malam partem non interpretetur, et me sibi commendatum habeat. Vale. 7. Octobris Anno 1602.

Magn. Nob. Tuae
officiosissimus
Keplerus.

Postscripta.

Lunae eclipses antiquae ad Solis motum sic possunt esse utiles, si de anno et mense certi simus, et pro die nox sit facta, tunc correctio Prutenicis non tantam eclipsin praebentibus adhiberi potest: ea vel in motibus

[illegible] Solis et Lunae mediis vel in alterutrius aequatione, et sic varie. Poterimus autem adhibere hodiernas aequationes Lunae tanquam perpetuas et [illegible] facere. Ita et per hodiernas aequationes Solis. Sed res est [illegible] perplexa ob varietatem, dum omnia suspecta sunt. Apogaeum, eccentricitas, motus medius, obliquitas eclipticae, Lunae anomalia, motus medius, eccentricitas, parallaxis, insuper latitudo, item hora diei ignorata. Quare [illegible] circumspectione opus est, ubi incipiendum, quid pro indubitato ponendum, quae experientia per ceterorum planetarum motus confirmanda sit. [illegible] et ceterorum planetarum motus utiles esse possunt indirecte, ut geometria aliis ad mores et ad omnes subtiles artes utilis esse dicitur, ingenia [illegible] acuendo.

Alio modo planetarum ceterorum, ac praesertim Martis et Veneris theoriae proderunt Solari theoriae. Si lineas saltem in singulis observationes [illegible] (quales sunt, si cum fixis visi sunt conjungi), tunc quia scio, [illegible] omnes praeter unicam esse ex Sole ejusque eccentricitate, [illegible] itaque, minutane Solis eccentricitas an aucta illis prosit. Sed hic [illegible] ponendum est, eccentricitates planetarum esse constantes. In summa [illegible] inveniendum est. Nam propter defectum observationum idonearum non [illegible] multiplicibus meris problematis astronomicis, ut methodo pro[illegible] infallibiliter ad finem suum procedente ex sufficientibus principiis.

[illegible]

Hervagius: Ehrenvester etc.
[illegible] Schreiben hab ich vol empfangen und will das [illegible] haben einen Versuch [illegible] T. II, p. 787 [illegible]

[illegible]

Ersuche demnach den Herrn freundlich [illegible] ... [illegible] hierüber [illegible] ... [illegible]

Dass ich aber sonsten den Herrn ab investigatione [illegible] wolte (v. II, 77), absit, und weil ich [illegible], dass [illegible] laris laborirt, weiss ich nit, ob der Herr den [illegible] [illegible] [illegible]. [illegible] ... „Est etiam quidam ex illis, qui [illegible] ... petit, esse partem 106am [illegible] diei [illegible] Albategnius [illegible] ... Atqui constat, juxta seculum nostrum esse partem [illegible] ... noctii &c.) qui erat temporibus Eluphi, cui [illegible] ... [illegible]. Et ipse quidem [illegible] ... temporum [illegible] comparandum [illegible]. [illegible] ... suo, qui quidem conveniebat cum observatione Eluphi, [illegible] a. Ch. 1148. (v. s. p. 507.)

Et quoad planetas, occurrunt mihi [illegible] ... Caroli M. observavit eclipses [illegible] ...

His addit [illegible] ... p. 790, [illegible] ad [illegible] Tabula [illegible] ... (Datae sunt hae literae Monachii d. 20. Oct. [illegible]) ...

Keplerus respondit (12. Nov. [illegible]): [illegible] 3. Nov. accepi, eas enim Mainhardus per [illegible] ...

Maestlini judicium avide exspecto, [illegible] ... prius quam has ego acciperem. Spero [illegible] ...

Ad quaestionem et de numero anni [illegible] ... quod ante dictum est. Verum sic [illegible] ... occasionem sane Reinholdo Ptolem[illegible] ... affirmavi non ex relatione aut lectione [illegible] ... [illegible] Hipparchi, Ptolemaei [illegible] ... [illegible] Albategnius [illegible] ... [illegible] secundum Albategnianam [illegible] ... [illegible]

Ptolemaeus, qui solus hodie nobiscum loquitur, [illegible] liberari [illegible].

Gratias ago, quod me monuit M. Tua de loco Rabbi Aven [illegible]. Jam pridem, cum in libro Scaligeri de temporibus id legissem, quaesivi a Judaeis [illegible], an posset mihi fieri copia ejus auctoris. Dicunt, amissum in Hispania.

Quae jam Keplerus addit de ☿ et ♂ vide Vol. II, p. 755. 759. et III, p. [illegible]. Deleta [illegible].

Petis denique a me comparationem calculi Tychonici et Prutenici, [illegible] scilicet verissima hora mediae conjunctionis luminarium ex Prutenicis, quomodo 1) vera loca Solis et Lunae, 2) ipsum sed aequale tempus verae conjunctionis, 3) apparens tempus verae conjunctionis ex sententia Tychonis inveniatur.

I. Locum verum Solis ad quodcunque tempus ante Christum, quod proponitur, invenire, non docent tabulae Tychonis editae.

Nam institutum Tychonis versatur in proximis seculis; de antecactis sententiam nondum dixit, certus rationem illorum temporum esse aliam, quam [illegible] hodie, propter mutatam eccentricitatem, de qua minus quam ego dubitavit. Ac in computandis eclipsibus Ptolemaei usus est tabula aequationum [illegible] Ptolemaica, apogaeo Solis Ptolemaico, praecessione aequinoctiorum [illegible] Ptolemaica seu ex Ptolemaeo Prutenica, nisi quatenus motum Solis [illegible] a fixis nonnihil alteravit, propter suas recentes observationes. [illegible] haec probem, simul ut exemplo praeeam, si forte imitari velis, quod non [illegible] consultum esse (quando quidem exempla petis): [illegible] locus Solis [illegible] anno Christi 133. 6. Mai. h. 11. 15' Alexandriae in prima ac eclipsi [illegible]. Invenio igitur in compendio eorum, quae Christianus Severini [illegible] in Lunae restitutione laboraverat, annotatum locum Solis [illegible] 13' 14", medium 1° 12' 21'. Ptolemaeus ponit itidem verum [illegible] momentum [illegible]. Bullialdus e Prutenicis verum [illegible] 22", medium 1° 12' 20" [illegible]

[illegible]

maeq. Nam aequatio Tychonis 20 maxima [illegible]
Et motus apogaei Tychonici diminutus, adeo [illegible]
6 annuatim.

11. Locum Lunae verum computare non [illegible]
maxima Solis aequatione vel loco apogaei [illegible]
hac distinctione tria requiruntur, motus simplex [illegible]
tabula aequationum. Quod simplicem ☽ attinet, [illegible]
ex Ptolemaicis et suis eclipsibus, comparatio [illegible]
haec est: in puncto eclipsis maximae Luna [illegible]
quot contineat gradus vel minuta ejus signi ad [illegible]
est. Ceterum hoc interest ad rationes Lunae, [illegible]
est motus ejus medius a medio loco Solis. At [illegible]
non coincidunt. Ergo si Ptolemaeus et [illegible]
11 ⅔, quo momento fuit medium deliquii, [illegible]
ex tabulis aequationum Ptolemaica, illa vero [illegible]
utique verus motus Lunae eo momento a Sole [illegible]
tum sc. 43′. Itaque etsi alter terminus [illegible]
ad Ptolemaei tempora quantitas mensis Lunaris [illegible]
tempore sub Trojam captam per 24 et [illegible]
id quidem per aequationem Lunae, quotiens [illegible]
ceteris omnibus anomaliae locis [illegible]

Jam quod anomaliam attinet, [illegible]
plex. Ad tempora Ptolemaei ex [illegible]
tus. Itemque ad nostra tempora [illegible]
motus efficitur. [illegible]
13° 15′ [illegible] per eccentricitatem [illegible]

[illegible]

et aliis apparet), monere posse, parum profuturam ejus calculum Solis et Lunae, si quis illum cum omnibus praesuppositis sine delectu temporibus Christi accommodare velit. Quod qui facere volet, ille sequatur praecepta in Progymn. et solvat triangulum, quo locum Lunae quaerit extra veras oppositiones. In ipsis oppositionibus habet compendium per motum horarium Lunae fictitium.

Hinc jam patet, quod supra secundo loco mihi imperabatur: quomodo ad datum mediae conj. tempus verae oppositionis medium tempus inveniatur ad tempora Christi; potest enim fieri dupliciter, prout aequationem hanc vel illam usurpare placuerit: me suasore per anomaliam Solis annuam ex Prutenicis collectam excerpat aequationem Solis itidem Prutenicam, et per anomaliam Lunae ad datum tempus mediae oppositionis excerpat aequationem Lunae, sumendo medium inter Ptolemaicam et Tychonicam, et si utraque et Solis et Lunae sunt diversarum affectionum, colligat illas in unam summam cum titulo, quem Solaris habet aequatio; sin ejusdem sunt affectionis, minorem a majori auferat, residuo titulum faciat, quem habent aequationes ambae, si a Sole stat excessus, contrarium si a Luna. Reliquum praecepti expediam per correctionem textus in Lunaribus folio 120 [illegible] 16 „Aggregatum autem prosthaphaeresium in casu priori, et differentiam earundem in posteriori in tempus quaesitum sic resolve. Cum iisdem multiplica 24 horas, et summam partire in motum diurnum Lunae a [illegible] illum anomalia Lunae ex columna prima tabulae suppeditat. [illegible] seu horas quae prodeunt, pro tituli exigentia quem fecisti, adde [illegible] subtrahe tempori opp. et conj. mediae.

[illegible] In exemplis propositis, quae illa ipsa sunt, quae jam olim computavi [illegible]

[illegible]

appositus erat diurnus ante suum horarium, ut tres columnae essent. Diurnus fictitius in conj. et opp., diurnus ante et post, et horarius ante et post. Tot ordines numerorum paginae forma ferre non potuit, et per se res eodem recidit. Itaque haeredes privato consilio opera studiosi Jo. Erikson diurnum utrinque removerunt, horarium utrinque substituerunt, ut duae tantum columnae fierent. Id factum sane non male, et monueram de hoc in meis notis, quas a me cum aliis quodammodo extorserunt: sed oportuit et verba praeceptorum mutare et novae formae tabulae accommodare; imo vel sine tabulae mutatione praeceptum alicubi plane corrigere. Sed nec ipsi considerati fuere: dum praecipitantur omnia, nec me arbitrum invitis et offensis, imo et juridicas actiones minantibus ingerere debui. Quae hactenus errata deprehendi, scribam.

P. 02. puto scribendum 1567. Apr. 9. h. 0. 0′. 6 d. 29′, nam ita invenio ab ipsis inventum in calculo.
P. 04. Centro B nuspiam assignat suum certum situm. Sciendum igitur, AB esse lineam ejus apogaei, quod constituitur, si pro epicyclo scriberetur eccentricus; circumit enim B sub zod. annis circ. 8. Idem p. 024, ubi KC || AB.
P. 06. in calce pro ♏ — ♑.
P. 07. 1540 sub tit. Anom. lege 1 sig. 1. 23. 21. Passim eclipsis pro eclipsi. Et 029. in in tit. Nodorum.
P. 125. lege a. 1596.
P. 029. fronti et calci ascribe: Verus motus Lunae a vero Solis.
P. 112 vero: motus lat. verus. Id puto facere ad meliorem Tab. intellectum.
P. 127 l. 12. Verba „ob implicationem annuam" parenthesi notaveram, in notis monebam, videri ex priori restitutione hic impertinenter restare. At manserunt in textu cum parenthesi; ita signata cum sint, plus lectorem feriunt, quam antea.
P. 128. Luxandi marginales inferiores ad dextr. ascendentes, et cyphra a summo loco in imum detrudenda. Ibid. secundarum ordo sub anom. 5 talis esse debetur: 45. 53. 0. 8. 14. 18. 21. 23. 25. 26. 27.
P. 129. Sub tit. horar. lege 8. — textu l. 5 et 10 adde simplicem; lege mensis 14.
P. 130 l. 5 l. 33′ 21″; fine l. per motum Lunae hor. ex II. columna.
P. 132 l. 5 iterum adde simpl. l. 12 horarium ☽ ex prima columna, qui est 27′ 44″.
Fol. 133 l. 30 lege: ut ex secundae tab. columna liquet.

Hi hactenus errores mihi occurrerunt, si M. Tuae aliqui occurrant, praesertim si quid vides in calculo Solis, id mecum rogo communices. Nescio an illum dicas, cujus exstat mentio ineptissima in erratis (ad fol. 22), quam hercle indignabundus lego. Usurpant enim mea verba, quae ego monendi causa adscripseram exspectans ut colloqueremur, an et quomodo monendus esset lector. Nam his sane crudis verbis ex musca elephantem faciunt, cum in apogaeo Solis vix duo scrupula efficiat, in ceteris nihil verbo dignum: et possit per aequipollentiam arcuum parvorum cum suis subtensis excusari. Miserrima libri conditio, quem auctor 20 annos parturit, tandem haeredes festinantes ad nundinas abortierunt.

IV. Restat ultimum postulatum, de aequali tempore verae conjunctionis in apparens convertendo secundum Tychonis mentem. At expeditissima ratio est ejus ante et post Christum. Nam differentiola, quae se immiscet ob diversam olim obliquitatem, nullius est momenti, aut si cui lubet ἀκριβολογεῖν tolli potest per tabulas primi mobilis Reinholdi.

In primo exemplo ☉ est in 23° ♋, in secundo in 20° ♌. Tychonis aequatio 7′ 22″. Ut fiat apparens, fac contrarium titulis. Contra, quia tempora ante epocham, fac iterum contrarium.

	3. 2. 1. 59. 29. 44	— 2. 59. 31. 33. 27½
	7. 22	9. 42
Temp. app.	3. 2. 1. 59. 37. 6	2. 59. 31. 43. 10

[illegible] Si quis vero nolit negligere aequationis partem alteram a Tychone exter[illegible], is [illegible] Prutenicarum modum aequationis primum. Jam enim non [illegible], sed Ptolemaico modo aequabit.

[illegible] Kepleruo; conclusio literarum in manuscripto deest. Ex Herwarti [illegible] [illegible] 26. Nov. 1602, haec tantum ad praecipua pertinent: Dem D. Tengnagel [illegible] [illegible] und wegen Ergenzung des Abgangs dank gesagt.
[illegible] temporis aequinoctii ab Albategnio observati zweifelt mir nit, dass sich [illegible] und tunca tropicos pro aequinoctialibus Ptolemaeus [illegible] [illegible] nit wüsste, wie es sich sonsten vertheidigen liesse. Das von Ptolemaeum beziehe [illegible] auf die errores chronologicos und observationes crassiori Minerva factas.
Von Hipparch ist „de magnitudine anni" nichts verhanden. Das so anno 67. zu Florenz [illegible] ist sein Werk nit.
[illegible] die zugeschickte declaration super calculo Tychonico und der Sphalmata im Druck [illegible] mich bedanken.
[illegible] Herwartus, pro transmissis Tabulis Kepleri Lunaribus (vide supra pag. 30) [illegible], addit: Die Tabulas hab ich gar gern gesehen, und hat der Herr den [illegible] hieran gewisslich ein sonderes beneficium gethan. (Da sie blos temporales [illegible] 1400 ad 1600 — so sind sie mir zu den finsternissen, so circa tempora Christi [illegible] Christum sich begeben, als welchen ich allein nachtrachte, nit dienstlich, trag sorg, [illegible] ad tempora ante Christum nit zu extendiren.
[illegible] halt auch für gewiss, dass wenn diese dilucidatio tabularum gedruckt und den [illegible] würden, es werde zu besserem Abgang der Progymnasmatum dienen. [illegible] Ich will auch nit unterlassen, quoquo [illegible] Tychonis [illegible] zu [illegible]. [illegible], wie solches geschehen solle; denn ich, wer sie eigentlich seyn, [illegible] [illegible] ich [illegible].
[illegible] München d. 6. Juni 1603.

[illegible] (d. 5. Jul. 1603) [illegible] Vol. I. p. [illegible]. Reliqua [illegible] in prioribus literis scribis, diu delituisse Lunaria mea, quod [illegible] aliquid suspicor; rogo itaque [illegible] in [illegible] faciat M. T., an in lituris quibusdam agnoscat M. T. [illegible] [illegible] eclipses, non dissimulandum, [illegible] ex tabulis Tychonis [illegible] eclipsis medium momentum, in [illegible] ubi Tycho [illegible] suum, rectilineum, [illegible] [illegible] hoc [illegible] compendium [illegible] [illegible] aequatio [illegible] [illegible] Quomodo vero tabulas Tychonis ad [illegible] accommodari, scripsisse me memini [illegible]. Ea ac[illegible] in his meis tabulis [illegible] et requirit multa, de quibus [illegible] sunt [illegible] inhabiliores sunt hae meae ad antiqua [illegible]. Ac etsi possent accommodari, non tamen [illegible] quidem meum consilium et [illegible]
[illegible]

Oriatur 18° ♑ sub E. P. [illegible] Angulus [illegible] 55 semidiametrorum. Ergo [illegible] in fronte, [illegible] quaerens invenio 53′ 13″ parallaxin latitudinis [illegible] modo supra Terram. Et ut propius accommodem [illegible] semid. est horizontalis Lunae parallaxis 62′ [illegible] est parallaxis Lunae a Sole 59½′; hanc quaerens [illegible] venio illam fere sub 58 semid.; itaque in [illegible] 50′ 27″ parall. lat. Lunae a Sole. Jam [illegible] enim DE horizon, BA verticalis, CA ecliptica. [illegible] erit BAC 57° 28′. In triangulo igitur BCA [illegible] dantur angulus A et BA et BC latitudinis [illegible] 59½′, BC est 50½′, quaeritur CA longitudinis [illegible] talis, idque ut lubet, abundamus enim datis: [illegible] feste rectilineum, erit CBA aequalis CAD, ut [illegible] sic sin. CAD, id est CBA [illegible] est 82. At non ut BC sic et CA [illegible] manet aequalis, sed mutatur [illegible] 58°; per hanc distantiam iterum [illegible] zontalem longitudinis Lunae a Sole [illegible] titulus abest, [illegible] hibet 16′ 10″ [illegible] longitudinis Lunae a Sole [illegible] Lunae a Sole, ubicunque fuerit Luna in [illegible]

Ita vides, unica brevissima [illegible] in sinum anguli eclipticae [illegible] exhibet parall. longit. Lunae [illegible] De latitudinis parallaxi [illegible] mentum per analogiam [illegible]

In [illegible] Optica [illegible] pulus Astr. Pars [illegible]

[illegible]

[illegible] mea nihil aliud fuit, quam ejusdem restitutionis ampliatio, ut intelligeretur, diversis hypothesibus idem praestari. Tu ipse affirmas, [illegible] tibi [illegible] superesse. Mihi vero ad meum institutum [illegible] fuit [illegible], ut id obtinerem, quod agebam, scilicet ut calculum [illegible] in tabulas conjicerem. Poterit alius forsitan idem praestare [illegible] hypothesi Tychonianae: ego tunc quidem tam felix non fui, et inclinatum [illegible] ad formam physicam, quam amplector prae ceteris, quoties [illegible] officium facit. Ex praefatione ad Herwartum aliquid fortasse [illegible] suscepi, quod refutationem vel omnine [illegible] aliquam sapiat: [illegible] obscura sit hypothesis et quasi tabulae non sublevent calculum labore [illegible]. At primum ego illam praefationem ita immutavi, ut Tengnaglio [illegible]; deinde nihil ex me dixi, sed ab aliis et ab Herwarto ad me scripta [illegible], ut literis auctorum cuivis quovis tempore demonstrare possum. [illegible], si dubitas me sic in praefatione loqui, pete illam a Tengnaglio; [illegible] apud illum manu Matthiae (Seifferti) sine quidem mutatione, qualem [illegible] ex me ipso, non qualem ex sententia Tengnaglii immutatam. [illegible] acceperis, addam ego quae fuerint mutata. Nihil ergo in mea [illegible] est, quod mereatur nomen refutationis. . . . Non opinor, [illegible] legisse, quod vehementer [illegible] de transfor-[illegible] hypothesi Tychonianae [illegible]. Itaque non aegre [illegible] tui [illegible] mihi ad institutum meum modus sufficit ac forsitan idem [illegible] fuerit. Quin hac commemoratione me excusas de ea supervacu-[illegible] cujus me insimulaveras. Nam si tibi placuit [illegible] modis [illegible], [illegible] mihi [illegible]. Nec est major gloria, quod in hoc [illegible] alieno. Nam quae publici juris sunt, aliena [illegible] Ptolemaei observata Copernicus in suam hypothesin [illegible], [illegible] Copernicana in antiquas Ptolemaicas hypotheses. [illegible] accepe, ut [illegible] me nihil magni praestitisse, [illegible] te [illegible]

[illegible]

condi faciliter per aliam imaginationem hypotheseos; tantummodo hoc pro jure suo ursit, ut id primum perficeretur, quod sibi esset visum, Ephemeris nempe), et ego id, quod levi mea opera fieri posset, Tengnaglio inviderem, ne is de re non magni momenti et meae inventionis olim gloriari posset. Ita factum simultatibus, ut res, se ipsa ab initio exoptata, postmodum verteretur in fel et acetum; praesertim cum ego opus non prius monstrarem Tengnaglio, quam jam scriptis ad Herwartum literis et postae commendatis, exemplum, quod videbat Tengnaglius, etiam postae commendaturus essem. Nam vix obiter hypothesin Matthiae delineaveram, atque ex eo non verbo uno dicto intra 6 septimanas jam perfectas esse tabulas indicavi. Haec importunitas nova exasperabat antiquas et diuturnas simultates. Tengnaglius ipse opera Johannis (Eriksen) et Matthiae tabulas hujusmodi condidit, quibus meas facilitate superet; itaque non res est vitiosa, sed modus agendi: atque utinam scopum facilitatis attigissem propius; certus enim sum, gratias mihi acturos esse multos, contra quam tu.

Altera tua refutatio mei insituti est haec, quod labor triangularis suppeditet distantias Lunae a Terra, utiles in astrologia ob particulares parallaxes. Respondeo: calculus Tychonis a me non est sublatus, computet qui volet; nam mea transformatio exhibet easdem distantias. At si quis non quaerat distantias, sed nudam longitudinem, ei taediosum est, triangula consulere et distantias prius adire, quas primario non expetit. Tum autem, quid tu de circello argutaris ejusque effectu in variandis parallaxibus? Quid si in omnibus parallaxibus plus aberrares, quam circellus efficit? Non plane hoc affirmo, sed sub conditione. Nam si tu diametrum Solis et umbrae mordicus fueris tutatus cum parallaxi Solis, omnino tibi res haec recidet sub contradictionis comminatione, ut parallaxin Lunae evidenter mutare cogaris.

Iam ad alia venis, et si tuam reprehensionem tectam bene percipio, jam tu hanc particulam tituli mearum transformationum adoriris, quod dixi: „pro typo tabularum Rudolphi ad deliberandum propositas." Tu ergo miraris, audere me ceteros planetas, de quibus nondum constat, aequiparare Lunae. Non facio, mi Christiane; cur enim „ad deliberandum" proponerem, si jam esset exploratum? Scio, Lunae esse particularia multa, ac fortassis etiam planetae ceteri inaequalitatum numero et qualitate distinguuntur plus quam hactenus credidi. Unum autem est in tabularum transformatione, quod citra controversiam imitari possumus in ceteris omnibus planetis, si modo consultum fuerit (quod deliberandum esse dixi), ut scilicet per excessum temporis supra momentum, quo planeta in apogaeo eccentri fuerit, statim excerpatur anomalia eccentri coaequata; atque huc ego potissimum respexi, quia apogaea et nodi planetarum ceterorum valde tardi sunt, et facili opera computantur. — .... Quae ad singula eorum, quae praestita in Luna commemoras, dici fortasse possent ab astronomo, mitto, ne novas quaestiones serere videar non finitis veteribus, praesertim cum nihil habeam in praesens nisi conjecturas physicas, nec ex professo tractem Lunae negotium. Quid nunc de me meruit odiosissima illa tua exagitatio insolentiae ejus, quam mihi per nequissimam calumniam tribuisti? (Longomontanus recensitis iis, quae Tycho in Lunae theoria perfecit, addit: talia a te unquam praestari posse vehementer metuo. Id autem non metuo, quod ad praeclaram censuram omnium bonorum et intelligentium virorum de defuncto Tychone haec sordida tua insolentia magis sordescat et odiosa fiat.) Quid enim nisi ut te vicissim et tuam κακοηθείαν ex-

[illegible] tantum paginae spatium occupem, quantum tu occupasti. Sed [illegible], nec quicquam tibi ad tot convicia regero, nisi ut relegas schedam meam, eaque lecta quod ingenuum virum decet erubescas teque ira et falsa imaginatione literarum absentium praecipitatum doleas. (Ad verba [illegible] supra [illegible] Keplerus: Debacchare in larvam a te concinnatam.) Quod vero ne monitus quidem errorem deprehendis, eo te tanto magis [illegible] obstringis. Sed facessat odiosa exprobratio, orta ex contagio [illegible] [illegible]. Dicam ingenue, candide, astronomice. Tu parallaxes [illegible] explorasti seorsim, diametrum ☉ seorsim, diametrum umbrae seorsim. Ex his nosti Ptolemaeum inquirere altitudinem ☉ ex centro Terrae, [illegible] parallaxin ☉. Hoc tu neglexisti existimans, sufficere ut a veteribus et Tychone itidem seorsim parallaxis ☉ sit assumta. At si tu Ptolemaeum imitatus (vel non multo aliam methodum, assumtis aliis quam Ptolemaicis) ex parallaxi Lunae in transitu umbrae et latitudine umbrae, itemque [illegible] ☉ diametro, qualem assumsisti, quaesivisses tanquam ex [illegible] principiis elongationem et parallaxin Solis, non tantum non hanc [illegible] ☉ invenisses, quam Tycho ex veteribus retinuit, sed deprehen[illegible] tibi plane ad impossibile redire. Certe ego nunc demum video [illegible] consilium, cur ille Lunae et per eam Solis diametrum in eclipsi[illegible] [illegible] notam latitudinem et digitos eclipticos metiri maluerit, quam [illegible] ratione ex ipsis observationibus deducta. Nam me hercule [illegible] per se absurdus est. Si [illegible] [illegible] tibi videor, ad calculos [illegible] omnia tibi fient dilucida, nec me plura verba facere opus. [illegible] rationem adeo lubricam, ut intra 600 et 2000 semidiametros nihil [illegible] posse videatur de altitudine Solis. [illegible] hilaris sum, [illegible] [illegible] contentionem [illegible] me videor ad philosophiam [illegible] atque cum mea [illegible], qui Optica scripsi. Videbis [illegible] meo opere aliqua tibi placentia, aliqua contraria. Illud contrarium [illegible] [illegible] ☉ [illegible] [illegible] [illegible] ☉, [illegible]

[illegible]

[illegible] Keplerus.

Nobili et magnifico viro D. D. Joanni [illegible]
burg, Cancellario Bavariae, illustrissimi [illegible]
praesidi Suabae, Domino et Fautori [illegible]

Si nunquam in Magn. tuae familiaritat[illegible]
me vel sola illa tua egregia in literas volunta[illegible]
passim increbescens invitare ad te pot[illegible]
non tantum creberrimis abs te literis jam per [illegible]
sed etiam re ipsa nec uno in loco [illegible]
commodo expertus sum: equidem jam pridem [illegible]
dinem meam aliquo munere literario declarare[illegible]
fuisset. Cum igitur nuper in hoc [illegible]
rium mihi videretur successisse, teque [illegible]
tum potissimum doctrinae de eclipsibus [illegible]
mihi quisquam alius deligendus huic occupati[illegible]
magis, quod cum nihil hic aliud agam [illegible]
Tychonis Brahe placita de Lunae [illegible]
tomo nuper sunt publica facta, [illegible]
reddam: vix cuiquam id gratius [illegible]
studiose coluisti et mortui monimenta [illegible]
ipsum laboris hujus institutum te [illegible]
videtur: quod quale sit diligenter [illegible]

Postquam, quae dixi, Progym[illegible]
nares prodierunt, diversis [illegible]
ab aliis ad me perscripta sunt, [illegible]
hypothesis et a natura alienam [illegible]
tabularum numeri satisfactum [illegible]
etiamnum per doctrinam [illegible]
sit. Utrique hoc [illegible]
vel circellorum multitudo [illegible]
ingressus [illegible]

[illegible]

[illegible] jam et calculus in alterorum, quos dixi, gratiam et ut mathematici [illegible] labore taediosissimo liberarentur, accommodari facile potuit, composita tabula prosthaphaeresium menstruarum ejus epicycli, quem Tycho collocaverat ad Terram. Hae causae laboris hujus in publicum, de quibus, quod prius dicebam, tu rectissime judicabis, qui tuis hortatibus cunctantem me impulisti cum ad haec tum ad alia incommoda si fieri posset lenienda. [illegible] vero privatim causae suppetebant non contemnendae. Primum de tam [illegible]plicibus inaequalitatibus Lunae multa mihi cum Tychone vivo disser[illegible] fuit; quo hortatore semper aliquid tentabam, ut una quod ajunt fidelia [illegible] parietes dealbarem (una inquam hypothesi utramque inaequalitatem [illegible]rem). Sexcentos tentavi aditus cum plurimi temporis jactura: toties[illegible] jam devoratam praedam iterum e faucibus amisi. Nam mihi subinde [illegible]bat circellus ille ad Terram post dameta triangularis laboris lati[illegible]. Tandem igitur in apricum compendioris hypotheseos fuit protrahendus [illegible] cum omnibus artibus suis in tabulam conjiciendus.

[illegible] posterum itaque mihi erit expeditius, variam hujus prosthaphaere[illegible] permistionem cum dicta Tychoni variatione menstrua propius contem[illegible] et videre an sufficientibus observationum conditionibus suffulta, an [illegible] interdum suspicor) vel cum variatione Tychonica (cum physicam plane [illegible] esse necesse sit) vel cum Ptolemaica [illegible] menstrua epicycli [illegible] quid obtineat: sic ut susceptus a Copernico secundus epicyclus et [illegible] a Tychone adque Terram collocatus non plane illam Ptolemai[illegible] praestet, contra quam Copernicus lib. IV cap. 9 demonstrare [illegible]

[illegible] etiam periculum facere volui laboris tabularum Rudolphinarum [illegible]: quo nomine (etsi opus ipsum seu irritum seu non necessarium [illegible]) non mediocriter me profecisse censeo.

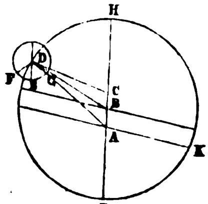
[illegible]

Hanc dedicationem sequitur pagina aversa: „Tabula aequationis dierum naturalium ad annum 1616 completum, quo anno apogaeum Solis ponitur in 6° ♋ completo: aequatio ☉ maxima 2° 3′ 45″,“ his adscriptis verbis: „Absolvi 14. Martii 1616. Non usurpavi illam in Ephemeride.“ — Hanc tabulam excipit:

Schema Hypotheseos Longitudinis.

Sit A Terra, B centrum eccentrici Lunae HDK, AB linea absidum, H apogaeum, I perigaeum. Motus hujus lineae est in consequentia a puncto aequinoctiali super puncto A seu centro Terrae aequabilis, restitutio annorum $8^1/_2$. Ad novilunia tamen comparatum hoc apogaeum videbitur ab illis retrocedere, quia semper prius ad apogaeum redit Luna, quam ad Solem. In eccentrico moveatur D centrum epicycli FG aequaliter circa C punctum aliquod, quod aequatorium dicunt. Estque qualium BD 100000, talium BA 5074, composita scilicet ex 2900 et 2174 dimensionibus Tychonicis, earundem BC est 5800 et DE semidiameter epicycli 2174 ut apud Tychonem.

Fig. 19.



Epicycli motus talis est: sit DE diameter in omni situ epicycli parallelos ad HI lineam absidum, monstrans epicycli puncta eccentrici apogaeo et perigaeo respondentia, ut E respondens puncto I perigaeo; quod perigaeum epicycli dicere vereor, quod abusu vocis lectorem nolim confundere, quia D in I transposito E omnium epicycli punctorum longissime ab A aberit, et sic antiqua vocis notione ἀπογειον efficietur. In hoc igitur E puncto sit corpus Lunae quoties centrum epicycli D in lineam per A Terram et corpus Solis utrinque productam incidit, in omnibus scilicet noviluniis et pleniluniis. Ab hac linea quantum centrum epicycli D digreditur motu ad A comparato, duplo hujus anguli corpus Lunae ab E versus G digrediatur. Ut si linea per Terram et Solem sit AK in antecedentibus signorum, quantus est arcus KHD, si ex A descriptus esset, duplo major erit arcus EGF, et Luna in F. Hanc hypothesin dico satisfacere placitis Tychonicis de Lunae motibus ad sensus subtilitatem. Nam quod Tycho non ipsius D puncti, sed paulo aliam distantiam ab AK adhibet (ut patet, si comparatio instituatur subtilissima), nihil tamen verbo dignum in effectum hinc resultat. Plus fortasse movebit lectorem, quod aequationes eccentri maximae in quadraturis circiter sesquiscrupulo majores fiunt Tychonicis; idque propter ea, quae Copernicus libro V. cap. 4. circa medium demonstravit. Ceterum sciat lector, hoc quicquid est a me non necessitate sed consilio praeteritum. Facile enim id cavere potuissem, si pro 8700, qui Tychoni in quadraturis tangens est, sinum 8667 elegissem. At quid opus mihi fuit rudem et asperum numerum repudiato Tychonico adsciscere propter tantillam differentiam sesquiscrupuli, cum Tycho ipse summam scrupulositatem tractabilium et rotundorum numerorum compendiis postposuerit. Nam fortuiti non sunt hi numeri 8700, 5800, 2900, quorum primus tertii triplus est, secundus duplus. Quare malui dimensiones Tychonicas retinere cum calculi compendio, quam ad ipsam effectus Tychonici subtilitatem adspirare sine necessitate praecipua.

Variatio Tychonica proprie est accidens motus medii. Nam qui ceteris planetis motus medius est, Lunae non est. Quoties enim Luna lineae AK per Terram et Solem transeunti appropinquat, etsi plane in concentrico

illam incitationem augeat: toties intenditur motus ejus celerius. Itaque vim quandam movendi obtinet tractus ille. Quod mirum esse minime debet in corporibus coelestibus, quae non externa vi vectium, ventorum aut aquarum, sed nutibus perfectissimarum mentium et geometricae imaginationis [illegible] cientur. Sic igitur habe: nisi inesset in illo tractu vis haec adventitia promovendi corpus Lunae, tantum futurum ejus motum medium, quantus esse solet in quadraturis (ceteris paribus): plures vero in una restitutione horas fore, quam jam obtinet. At quia jam accedit illa motio menstrua, quae illam necesse est et intendi initio tarde, cum Luna circa quadraturas brevibus passibus ad lineam AK appropinquat; ubi proxime venerit, majora hujus incitationis incrementa sunt, quod Luna e directo in lineam involet, non ut prius ex obliquo. Adeoque quae est proportio sinuum distantiae Lunae a Sole vel ejus opposito, haec est proportio incitamentorum. Quare si usurparemus Lunae motum pro medio, quantus in quadraturis est, semper adderemus illi incitationis aliquid, minimum tamen in quadraturis, plurimum in syzygiis. At quia antiquitus hunc pro medio motu adhibemus, qui ex toto circulo in dies unius restitutionis, ubivis illa altera commiscetur, existit tantus motus, quantus est ceteris paribus medio loco inter quadraturam et copulam, ubi et haec modo descripta acceleratio mediocris est. Is igitur motus quia in copulis parvus est, in quadraturis nimius, consequens est, ut illic augeatur hic minuatur. Unde quam prius accelerationem vel incitationem dixi, variationis nomen apud Tychonem obtinet. Haec de hac variatione dicere volui, partim ne circellum ejus viderer neglexisse, qui est tantum ad mensuram susceptus, non ad motus formam, partim ut lectorem mecum paulatim in contemplationem physicam inducerem. Nam idem plane (physicum nempe) judicium ferendum tandem erit et de [illegible] residuo epicyclo FE, quem parallaxes Lunares a Tychone observatae [illegible] nec patiuntur Lunam per illum [illegible] attolli vel deprimi. In [illegible] enim parallaxium, quas Luna in quadraturis pateretur, discursitare [illegible] 54 semidiametris Terrae in 60 circiter. Quod Tycho termi[illegible] prorogavit a 52 in 61, quod ipse in capitulo de [illegible] parallaxibus monuit. Dubium non est, quin [illegible] in qua[illegible] quam in copulis idem spatium [illegible] semidiametrorum Terrae [illegible] descensusque occupet, [illegible] seu latentem [illegible] epicyclum [illegible].

[illegible] et [illegible] transformatarum
ad schema [illegible]

nodi in praecedentia; in quarta, scrupula [illegible]
differentiae inter lineas AD et AE [illegible]

In tertiae tabulae marginibus sunt [illegible]
E incepto, et GF ab F incepto. Sequuntur in [illegible]
(si D fingas in K constitutam), ut F a G [illegible]
epicycli dispositum intelligatur. In secunda [illegible]
DAF, si D in I perigaeo constituatur. In [illegible]
arcubus GE. In tertia occurrit variatio [illegible]
scripsi; in quarta prosthaphaeresis [illegible]
titulis mutatis extendi ad duplicem distantiam [illegible]
scrupulis latitudinis in quinta columna [illegible]
mam accommodarentur et uno ingressu per [illegible]

Quartam tabulam addere supervacuum [illegible]
latitudo Lunae cum excessu et reductione ad [illegible]
hae tabulae, quamvis divisae, exstant in [illegible]
sine quibus hae meae tabulae [illegible]
ut si cui placeat compendiosus [illegible]
describendo conjungat. [illegible]
[illegible] lectori [illegible]

I. Epochae aequalium [illegible]

[illegible]

Anni	[illegible]
1400	[illegible] 27. 20
1420	11. 17. 32. 40
1510	14. 18. 12. [illegible]
[illegible]	[illegible]
1600	[illegible]

II. [illegible]

[illegible]

IV. Typus aequationum Lunae [illegible].

☽ a ☉	0.	45.	90.	135.	[illegible]
0	0	0. 40½. A.	0	0. 40⅓. S.	[illegible]
45	3. 27 Sub.	4. 59 [illegible]	5. 1. 17 S.	4. 3⅓ S.	[illegible] S.
90	4. 56⅓ S.	[illegible] 41⅓ S.	7. 29⅔ S.	6. 46 S.	[illegible]
135	3. 35⅔ S.	3. 2 S.	5. 35 S.	6. 4 S.	3. [illegible]
180	0	0. 40⅓ A.	0	0. 40⅓ S.	0
225	3. 35⅔ Ad.	6. 4 A.	5. 35 A.	[illegible] 2⅓ A.	[illegible] A.
270	4. 56⅓ A.	6. 45 A.	7. 29⅔ A.	5. [illegible] A.	[illegible]
315	3. 27 A.	3. 57⅓ A.	5. 1. 17 A.	4. 59 A.	3. 2[illegible] A.
360	0	0. 40⅓ A.	0	0. 40⅓ S.	0

[illegible] distantia variatur a 97100 in 102900, eccentricitas vero a 4400 in 0, [illegible] proportionis laterum variatur a 91312 in 100000.
[illegible] gr. 1. — 174550 × 92000 = 1605
17455
93 — [illegible]
94 — 1641
95 — 16[illegible] His in principio sunt proportionalis
96 — 1676 [illegible]

V. Motus in annis singulis usque ad viginti.

Anni.	Adde Temp. reduct. ad [illegible]	Adde Apog. eccentricit.	Subtrahe Nodi [illegible]
	D. H.	S. G.	S. G.
1.	6. 18. 58. 26	1. 9. 54. 38	0. 18. 58. [illegible]
2.	18. 13. 56. 52	2. 19. 49. [illegible]	1. 7. [illegible]
3.	20. [illegible]	3. [illegible]	1[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

Quarto, si ... similiter 1) tempora, et addantur temporibus ... et addatur epochae superiori, rejecto integro ... subtrahatur ab epocha superiore, ut ipsi ... adscito, si opus est, integro circulo.

Quinto summam dierum mensis completi, ... cum horis et scrupulis adde temporibus ... medium anjus anni superent.

Sexto haec summa temporum ... integrorum. Nam alias propior erit proxime ... alias proxime majori.

De primo casu prius. Ergo subtrahe ... temporibus, motum vero apogaei juxta ... a superioribus, ut prius etiam factum. ... tabulam inaequalitatis primae. ... sub titulo temporis: quod juxta ... coaequata centri epicycli, in sequentibus ... nodi, cum quibus age secundum ... anomaliae motus addatur motui apogaei ... subtrahatur motui nodi ... adserventur. Sin autem residuum ... age ut solet fieri, proportionaliter ... duum per differentiam temporis juxta ... et nodi ... vel sine ... differentia nunquam est major, quam ... (nodi 13″).

In casu ... tabula revolutionum ad proxime majorem ... chaim tuam ... a proxime ... gaei et nodi age ut prius. ... ex tabula inaequalitatis primae ... apogaei et motum nodi ... quia prius ... pora ferebat ... debetur, ... te hujus ... tatis primae ...

phaeresin [illegible] scrupula latitudinis adservanda. [illegible] Tychonica in hunc usum transtulimus et in has, ut compendiosa esset [illegible].

Octavo. Anomaliam centri coaequatam in casu priore subtrahe ab hac duplici distantia, in posteriori adde (nam erat illa [illegible] ipsa anomalia, sed ejus complementum ad circulum). Cum eo [illegible] ex tabula inaequalitatis secundae excerpe prosthaphaeresin epicycli cum excessu, de quo per scrupula longitudinis ex primae inaequalitatis tabula adservata pars proportionalis addita constituet emendatam prosthaphaeresin, quam una cum variatione pro cujusque titulo adde vel aufer longitudini centri: ita colliges veram longitudinem Lunae. Ubi et nodi prosthaphaeresin prout tituli te docuerint addideris vel abstuleris a loco nodi, verum habes et hujus calculum. Per vera loca Lunae et nodi et scrupula latitudinis ex secunda tabula adservata poteris excerpere ex tabellis Tychonicis latitudinem Lunae veram et reducere locum orbitae ad eclipticam. Nam hic nihil est varietatis a praeceptionibus Tychonis, tantum consulo, ut ex [illegible] tabulis unicam facias, quo expeditius excerpas.

Ceterum plus est in praecepto verborum, quam laboris in opere. Quare rem exemplis declarabo.

Exemplum prioris casus. Sit tempus aequale in meridiano Uraniburgico 1540. 31. Dec. h. 1. 45′.

	Tempus	Apog.	Nodus
	1520. — 26. 22. 2. 24	— 7. 1. 15. [illegible]	— 1. 0. 10. 33
	19. — 22. 19. 15. 58	— 1. [illegible] 32. 55 ad.	— 0. [illegible] 14. 35 [illegible]
Dies Novembr.	335. 0. 0. 0		Scrupula [illegible]
Dies compl.	30. 1. 45. 0		[illegible] 12″.
Summa:	414. 15. 8. 22		
Revol. XV.:	413. 7. 38. 49	— 1. 18. 2. 57 ad.	— 0. 21. [illegible]
Residuum:	1. 11. 24. 33	[illegible] 49 ad.	[illegible]
Ex tabula:	1. 10. 46. 11		[illegible] sub.
Et residuum:	38. 23	[illegible] 9 ad.	0. 1. 56. 9 Locus nodi simplex.

[illegible]

Variatio 38. [illegible] Prosth. ☊ 1. 44. 6. sub.

[illegible] 0. 0. 17. 9 loc. nodi ver.

Prosth. 6. 57. [illegible] 1. [illegible] 20. 38 [illegible] 4 [illegible] ☽ verus

[illegible]

[illegible]

1. 9. 42 summa subtrahenda.

11. [illegible] centri locus eclip.

11. 7. 22. 16 longit. ☽ in orbita.

5. 9 add. pro reductione ad eclipticam.

11. 7. 27. 25. Locus ☽ eclipticus.

Addo et hoc exemplum.

Anno 1604, [illegible] in meridie [illegible]

[illegible]

diei 2. Octobris. Additur apogaeo in universum 4s 17° 14′ 43″, ut sit longitudo centri ad illam horam 6. 19. 1. 52, scrupula vero sunt 51′ 57″ servanda. Est autem illa hora locus ☉ 6. 19. 9. 52, qui subtractus a loco ☽, relinquit 11. 29. 52. 0. Cujus duplum 11s 29° 44′ 0″ exhibet variationem 12″ subtrahendam. Subtracta vero hoc loco anomalia 4s 16° a duplici distantia relinquit 7. 13. 44. 0 anomaliam menstruam, quae exhibet prosthaphaeresin epicycli 48′ 30″ add. cum amplificatione 5. 15, de quibus pars proportionalis ad scrupula servata est 4′ 33″. Hinc prosthaphaeresis emendata 53′ 3″ add. Hinc ablata variatio 12″ relinquit 0° 52′ 51″, addendum Lunae, ut sit ejus locus 6s 19° 54′ 43″. Itaque vides, quod Luna superaverit locum Solis verum per 44. 51. Quare divide hanc superationem per motum ☽ horarium, qui est ante et post ☌ ☍: et prodibit tempus verae ☌. At horarius ex tabula Tychonis per simplicem anomaliam (quam ex nostra coaequata centri anomalia scripsimus aestimatione crassiuscula) excerpitur 34′ 9″. Ergo distantiae 44′ 51″ respondent h. 1. 18. 14; subtrahe a 3. 30. 3, restat 2h 11′ 49″, tempus aequale pomeridianum verae conjunctionis.

IN HIPPARCHUM [illegible]

NOTAE EDITORIS.

1) p. 523. His Kepleri propositionibus [illegible] ratione demonstratis, in comparatione [illegible] apparent, [illegible] penetraverit.

1) Semiangulus coni umbrae idem est cum semidiametro [illegible] oculo in mucrone umbrae.
2) Semidiameter Solis apparens in Terra major est [illegible]
3) Semidiametri Solis in Terra apparentis et semianguli [illegible] parallaxis Solis horizontalis.
4) Parall. hor. ☽ in umbra existentis ubique major est [illegible] ☽ transitu per umbram.
5) Diff. semid. apparentis umbrae et parall. hor. ☽ [illegible] coni umbrae.
6) Semid. apparens ☉ et ☽ (aut cujusvis stellae) [illegible] eandem in omni distantia retinent proportionem.
7) Diff. inter semid. app. ☉ aut ☽ stellaeve, et [illegible] ubique eadem, sed in majori distantia minor, [illegible]
8) Diff. inter semid. app. umbrae et parallaxin [illegible] coni umbrae) in eadem Solis distantia semper [illegible] intervallum variatur.
9) Semid. umbrae [illegible] est ubique [illegible] intervallo, minor in majori; [illegible]
10) Semid. umbrae apparentis [illegible]
11) Neque tamen [illegible]
12) Inaequalis distantia Solis a Terra [illegible] in eodem ☽ per umbram [illegible]
13) Stella, ea, cujus parall. [illegible] Terra et [illegible]

Ad theorema [illegible] [illegible]

8) p. [illegible] $SR \times RH = KR \times RN$

$SR \times RH = (SN - RN) RH = SN \times RH - RN \times RH$, quare

$KR \times RN + RN \times RH = SN \times RH$, h. e. $KH \times RN = SN \times RH$.

$RH \times SN = (NH + RN) SN = NH \times SN + RN \times SN$.

$KH \times RN = (KZ + ZH) RN = KZ \times RN + ZH \times RN$.

$NH \times SN = KZ \times RN$.

Huic theoremati addit Keplerus hoc problema, ut non numeretur his verbis [illegible]:
„Utile computationi eclipsis Solis universalis."

Datis semidiametris disci et penumbrae, et distantia centrorum, indagare lineam per sectiones, et quantitatem arcus disci a penumbra intercepti.

Sit primo centrum penumbrae extra discum. Ergo distantiam centrorum duplica; cum duplo divide factum ex scrupulis in disco et scrupulis extra, prodit sagitta disci, quam duc in residuum disci; facti radix est sinus arcus dimidii disci a penumbra incepti.

Sit iterum centrum penumbrae intra discum. Ergo semidiametro disci adde distantiam centrorum; a summa aufer quantum est de semidiametro penumbrae intra discum, scilicet usque ad centrum: cum residuo divide factum ex scrupulis in disco et scrupulis extra, prodit eadem sagitta ut prius.

Demonstrationem, a Keplero omissam, hanc addimus:

1) Sit KAN „discus", SPH penumbra, centro A extra discum existente. Secundum theor. 18 (comp. initium hujus annot.) est

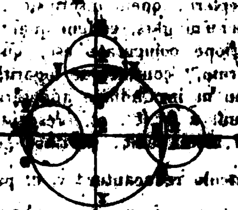


Fig. 8.

$NH \times SN = KZ \times RN$, quare

$$RN = \frac{NH \times SN}{KZ}$$

$KZ = KN + NZ = 2[illegible] + 2NA = 2[illegible]$

ergo $RN = \frac{NH \times SN}{2ZA}$

$KR = KN - NR$. Jam, quia

$PR \perp RN$, erit $PR = \sqrt{KR \times RN}$ = [illegible]

2) Penumbra LPM ex centro in discum [illegible] [illegible]

[illegible]

columna „Arcus quadrantis" eundem 17° 7½′, [illegible]

60 : 100000 = 17⅛ : x, x = $\frac{[illegible]00000}{18}$ = 29144 [illegible]

[illegible] tabulis Kepleri logarithmorum [illegible] Kepleri calculum supra positum, monendum [illegible]: [illegible] seu potius unice ad astronomiae usum [illegible] voluit, [illegible] sint numeri 24 et 60, praeter divisionem [illegible] in 24, aliamque in 60 aequales partes adjecit [illegible] adscripsitque sinibus, quos e tabulis trigonometricis [illegible] (incipiens a sinu [illegible] 26″ = 100, et inde [illegible] ascendit ad sin. 90° = 100000), logarithmos. Hac ratione [illegible] sunt longe aliam, quam recentiore aetate [illegible] plane regularem processum sequi, anguli vero [illegible] tabulae [illegible] hucusque usitatae, sicut [illegible] [illegible]. His dicta ratione [illegible], [illegible] angulis, quos tabulae exhibuerunt, computatas in hunc modum [illegible]

1° 15′ 30″. Respondentes huic arcui „partes [illegible]

= 0° 31′ 41″, eaedem „[illegible]" = $\frac{[illegible]}{100000}$ [illegible]

[illegible] alio quam [illegible] sensu acceptis [illegible] Kepleri, quem inscripsit „Chiliadis" (prodiit [illegible] narum pars, eadem quae jam [illegible] ratione computata est, qua „Chilias". Inscripta est [illegible] corum," [illegible] logarithmos tantum sinuum, [illegible] non ut in Chiliade adjectus est sinibus, [illegible] pit a 0° 0″, et [illegible] ordine singulas [illegible] ad [illegible], [illegible] „quadrantis" [illegible]

calculo [illegible]: v. c. partes 7 sexag. = $\frac{7 \cdot [illegible]}{60}$ [illegible]

putantur sinus ad r = 100000 [illegible]: 60 : [illegible]

[illegible]

[illegible] 11 [illegible] &c. [illegible]

[illegible]

151′ 40″ et 69′ 22″ [illegible]

[illegible]

[illegible] $IA = 12' 57''$, deinde [illegible] sagittam $IK = EK -$ [illegible] $= 16'\ 10''$, et $IM = AI + AM = 12'\ 57'' + 17'\ 4'' =$ [illegible], [illegible] quantitas defectus $= KM = KI + IM = 31'$ [illegible]

5) p. 530. Cum sit (theor. 17): $AB^2 - OE^2 = 2OE \cdot AP$, erit

$$AP = \frac{AB^2 - OE^2}{2OE}$$

$AB = 54'\ 22''$; 2 log. $54'\ 22'' = 3{,}4706654 =$ lg. $49'\ 15''$.
$OE = 33'\ 20''$; 2 log. $33'\ 20'' = 3{,}0457974 =$ lg. $18'\ 31''$
$AB^2 - OE^2 = 30'\ 44''$
log. $30'\ 44'' = 1{,}4876096$
$2OE = 66'\ 40''$; [illegible] $= 1{,}8239087$
$0{,}6637009 - 1$
$AP = 0{,}4610 = 27'\ 40''$

Keplero prodit $AP = 27'\ 6''$, quia pro $2OE$, $2OF$ posuit.

Jam, quia OF (diameter Lunae) est $34'\ 2''$, ergo $EF = 34'\ 2'' - 33'\ 20'' = 42''$, prodit AE („arcus latitudinis") $= AF - EF = 17'\ 1'' - 42'' = 16'\ 19''$ et PE (semidiameter umbrae) $= PA + AE = 27'\ 40'' + 16'\ 19'' = 43'\ 59''$.

6) p. 531. Secundum theor. 16, est $DB^2 - CB^2 =$ [illegible] $(DA + AC)$, et cum sit [illegible], [illegible] $DE = 2EF$, [illegible]

$$DA + AC = 2EF + 2AE = 2AF;$$ erit

$DB^2 - CB^2 =$ [illegible] $2AF$, et inde

$$AF = \frac{DB^2 - CB^2}{\text{[illegible]}}$$

[illegible] datis AF et EF ($= \frac{1}{2} DE$) prodit AE ($= AC$) $= AF - EF$; denique in $\triangle ABC$ [illegible] rectangulo $AB = \sqrt{AC^2 - CB^2}$.

[illegible] $DE = 61'\ 44''$, $DC = 36'\ 30''$, $CB = 33'\ 46''$; [illegible] $DC + CB = 70'\ 16''$

2 log. $70'\ 16'' = 3{,}7646694$ . . . $1^\circ\ 30'\ 57''$

2 log. $33'\ 46'' = 3{,}1990852$ . . . [illegible]

[illegible]

$AF =$ [illegible] $= 1966''$ [illegible]

$AB^2 = (\text{[illegible]})^2 - (\text{[illegible]})^2 = 16'\ 43'' = 1003''$.

[illegible]

7) p. 534. In schemate [illegible] Lunae per [illegible] Lunae, [illegible] Solis visa ex E. [illegible]

[illegible]

11) p. 536. Cum „Tabulam parallacticam" [illegible] ex illa [illegible], jam formulis trigonometricis [illegible]

Assumta distantia centrorum Lunae et Solis [illegible] circulum per centra = 4° 9', prodit in triangulo sphaerico [illegible] 4° 9'; h. e. sinus latitudinis Lunae = sin. 4° 9' × sin. [illegible]

Lat. Lunae = 2' 14''; [illegible]

$$\text{Tg. longitudinis Lunae} = \frac{\text{cos. } 4^\circ\, 9'}{\text{cot. } 30'\, 40''};$$

Long. Lunae = 30' 35''; [illegible]

Deinde sin. parall. latitudinis = sin. 56' × sin. [illegible]

Parall. lat. = 62' 38''; [illegible]

Tang. parall. longitudinis = tang. 56' × cos. [illegible]

Parall. long. [illegible] 51'';

Sin. „longitudinis parall. in occasum" = sin. 42° 51' × sin. [illegible]

prodit 12' 58''.

Similiter in sequentibus prodit: [illegible]

sin. lat. Lunae = sin. 19' 20'' × sin. 49' [illegible]

12) p. 541. Loca fixarum ad annum 1600 [illegible] selectarum stellarum" ad quinam completum 1600, [illegible] (ed. anni 1602), nec non ex ejusdem tabulis [illegible] (ib. p. 81 sqq.).

Calculus autem Kepleri his illustrandis [illegible] (Lunae distantia a fixa), 61° 4' 17'' (compl. [illegible] Lunae); hinc cos. arcus aequatoris inter circulos [illegible]

$$= \frac{\text{cos. } 41^\circ\, 52' - \text{cos. } [illegible]}{\text{sin. } 61^\circ\, 4'\, 17'' \times [illegible]}$$

$$= \frac{0{,}74470 - 0{,}1[illegible]}{0{,}84483}$$

$$= 0{,}73115 = \text{cos. } 4[illegible]$$

Keplerus hunc calculum [illegible]

[illegible]

Motus Lunae horarius = 15° 8′ 43″ : 25 h. 26′ = 35′ 40″. [illegible] Keplerus abvens „ratione prosthaphaereseos", singulari [illegible] utitur compendio in multiplicatione et [illegible]:

$$430 \times 5664 = 42480 \, (6000 - 300 - 6) = 254880000 - 12744000 - 254880 = 24159{,}6480.$$

Divisio absolvitur „logistica sexagenaria", hac ratione:

$$\frac{15° \, 8' \, 43''}{25^h \, 26'} = \tfrac{1}{2} = 30' \qquad \frac{2° \, 25' \, 43''}{25^h \, 26'} = 6'$$

$$\tfrac{1}{2} \times 25.\,26 = 12° \, 43' \qquad 6 \times 25^h \, 26' = 2° \, 32' \, 36'' \, (> 2.\,25.\,43)$$

$$15° \, 8' \, 43'' - 12° \, 43' = 2° \, 25' \, 43'' \qquad 2° \, 32' \, 36'' - 2° \, 25' \, 43'' = 6' \, 53''$$

$$\frac{6' \, 53''}{25^h \, 26'} = \tfrac{1}{4} = 15''$$

$$\tfrac{1}{4} \times 25^h \, 26' = 6' \, 21''$$

$$6' \, 53'' - 6' \, 21'' = 32''$$

$$\frac{32}{25{,}26} = \frac{1''}{16''}$$

$$30' + 6' - 16'' = 35' \, 44''.$$

(5) p. 551. Ut lectores hunc et qui sequuntur calculos facilius comprehendant, haec [illegible]; quaedam quae supra (adn. 5) [illegible], huc quoque referenda sunt. Diurnus ☉ = 57′ 5″ multiplicatus in dies 8 prodit 7° 36′ 40″; idem in 17h 28′ [illegible] (Keplerus utitur logarithmis ex Tab. Rud. p. 2 sq.) exhibet factum 41′ 20″, [illegible] locus Solis ad d. 25. Julii 18° 32′ ♌. Item in Luna, [illegible] ex [illegible] e Tabulis Rud. ([illegible], quo Keplerus haec [illegible] ad calculum [illegible], sed ad [illegible]) ... ex tabula motuum Lunae [illegible] „tabula subsidiaria" (p. 94). Factum 17′ 8″, 35′ 40″ = 10′ 7″ [illegible] logarithmos (p. 2) [illegible] 17. 860 [illegible] ... p. 23. [illegible] ☊ [illegible] 4s 5° 39′ 54″ prodit addita „correctione" 26′ ad [illegible] 3° 45′ 6″, [illegible] 21′ 40″ et 1′ 40″ pro diebus 16 et horis 18. 17′, [illegible] 7 revolu[illegible] Lunae [illegible] 206 [illegible] 30° 12′ 56″ pro 7 revol., prodit locus ☊. [illegible] ex Tychone" [illegible] ... I. [illegible] In [illegible] Luna [illegible] a Sole, secunda [illegible].

(6) p. 552. [illegible] ... egit cum Keplero ab anno 1612 [illegible] a. 1625. [illegible]

[illegible]

Observatio Eclipsis

In monte Pesting (Poestling) dimidio [illegible]; unde [illegible] horologiorum et minus Otensheni et Wilderigae

Hora una post mediam [illegible] parum admodum ad sinistram [illegible]. Principium [illegible] stituto 22° et altitudine 28⅔ [illegible] correctius 29°, latere regulae vitioso, pro eo enim sequendum [illegible] principium hoc conspectum est per nubes [illegible] et ne paulo prius fuerit merum principium.

Ad probandum hoc azimuth [illegible] Andromedae 70°, sed rursum [illegible] regulae inferioris monstravit 66⅔. Tunc Luna [illegible] Antequam ala Pegasi veniret in id azimuth [illegible] Ala Pegasi in illo azimuth habuit altitudinem [illegible] erat 51½°), Fomahant in illo azimuth [illegible] ad 2 superiores in urna [illegible] vitiose et superiori latere [illegible] inter superius et inferius [illegible] duas [illegible] et cum [illegible] Serpentis, quae [illegible] minus ⅓. Azimuth Lunae [illegible] Tunc [illegible] per [illegible] et [illegible] triangulum in [illegible] oculum et [illegible] superfuit [illegible]

[illegible] Luna [illegible] altitudinem 1½°, [illegible]

ex lat. et semidiametro ☽ 48′ 54″, quod est insensibili minus quam 49′ 8″. Si autem parum augeatur diameter ☽, jam excedit umbram. Certe partem residuam aestimare non potui, praesertim in circumstantia limbi illustrati a radiis refractis et rubentis.

Finis Tubingae h. 4. 43′
Oritur ☉ in alt. P. 48⅓ h. 5. 14′

Diff. 31′. Si ergo finita fuisset eclipsis in ipso exortu Solis Lincii, dist. meridianorum esset 31′.

Maestlini observatio legitur in Hanschio p. 48.

16) p. 660. Barth. Pitisci, Grunbergensis Silesii, Trigonometriae, sive de dimensione triangulorum libri quinque (Aug. Vind. 1608. Primum prodiit hoc opus Francof. a. 1599, postea ib. a. 1612). „Axioma" IV, quod dicit Keplerus, inest libro IV. et sic se habet: si duo latera sigillatim quadrantibus minora [illegible] ipsa inter sese; deinde latus minus cum complemento majoris componas, et sinui arcus compositi posterioris sinum complementi arcus compositi prioris subtrahas vel sinum excessus [illegible] ut radius ad medietatem rectae per [illegible] sive subtractio [illegible] dictis duobus lateribus comprehensi ad rectam, qua subtracta de sinu arcus compositi posterioris, relinquitur sinus complementi tertii lateris; vel de qua subtractus sinus arcus compositi posterioris relinquit sinum excessus tertii lateris.

[illegible] „axiomati" addit Pitiscus in capite quod inscripsit: „Usus praecedentium axiomatum: quarto proportionum axiomati per accidens conveniunt (obliquangula triangula), in [illegible] vel ex datis tribus angulis latus aliquod, vel ex datis duobus angulis cum [illegible] interjacente tertius angulus inquiritur." In demon[illegible] ad lib. I, prop. 61, [illegible] Trianguli sphaerici latera in angulos [illegible] posse; complementis ad semicirculum pro latere et angulo maximo hinc [illegible]

[illegible]

EPISTOLA

DE SOLIS

quod die 12. Oct. 16

Keplero inde ab eo tempore
dabat, non contigit, ut totalem
tales conquirere potuit observationes
quibus
omni quo potuit studio
lestium
1605 hora

Brichtungen nemben mir die Zeit also hinwekh, dass Ich mich gegen meine gutten Freundte mit Briefen der Nothdurfft nach nit erzaigen möge.

Aus beyliegunden drey ansehnlicher Leütte Briefen hat der Herr zu sehen, wie lang es sey, dass sein opus durch mich an frembde Orth vberschickht und publiciert worden sey. Dessen sich nun der Herr zu erfreuen und beynebens zu getrösten, Er werde mit solcher Beschreibung an vielen orthen viel guetts und Ime selbst ein merkhliches Lob verursacht haben.

Was Er mich in seinen Diensten ferner zu brauchen, so hat Er mich dazue ganz willig. Gottes Segen mit vns allen.

Gräz d. 12. Tag Julii 1606.

Des Herrn dienstwilliger

P. Casal.

Inscr. Dem Edlen und Hochgel. Herrn J. Kepplern der Röm. Kais. Maj. Mathematico, meinem sonders freundl. und geliebten Herren Praag.

Epistolae, quas dicit Casalius, datae sunt a Ferd. Contarini d. 8. Apr. 1606, Comelfratta Cardinali d. Romá 7. Jan. 1606, et a medico J. G. Göpel, Martio 1606 (comp. vol. II, p. [illegible]). Quae Serarius et Zieglerus responderunt leguntur in Hanschio p. [illegible] et 391. Responsio Kepleri vol. II, p. [illegible]. Observationem Fabricii addito Kepleri calculo exhibuimus vol. II, p. 403 sq. Alii quorum literas Keplerus secum retinuit, sunt: Stanisl. Crzistanovic (comp. vol. II, p. 829), Aegidius Martini, advocatus Antwerpiensis, Dieterus et Malleolus Argentinenses. Eberhardus Schele, legatus Lüneburgensis, haec dedit Keplero:

S. P. D.

Clarissime Keplere.

Redditae mihi sunt hoc mane literae a Joh. Lossio scriptae Pragae 3. Dec., quibus adjuncta erant septem exemplaria epistolae tuae de Solis deliquio proxime praeterito ad [illegible] [illegible] amatores scriptae, quae quidem suis locis reddi curabo. Meditationes tuas super directionibus Fabricio nostro communicaram, verum ille nondum (saepius licet admonitum) remisit, alioquin dudum [illegible]. Faciam tamen, quam primum ab ipso recupero (comp. I, 356). Totus is [illegible] est in [illegible] judicio suo de nova stella, quod [illegible] edidit [illegible] [illegible] Duci Brunsv. et Luneb. Praeterea Calendaria et [illegible] [illegible] et [illegible]. De quibus [illegible] meum non est judicare, supersedeo. Epigramma [illegible] in [illegible] honorem a me scriptum addo:

[illegible]

Ehrenvester, Hoch und Welgelerten [illegible] lieber Herr und guetter Freund. [illegible]

Es schreibt mir ein [illegible] praeceptus calculi [illegible] Eclipsis Solis de anno 1605 in [illegible] mathematicis observiret [illegible] circiter juxta Cal. Nov. d. 12. Oct. h. 0½ c. defecquentia [illegible] autem incidentiae fuerit quius horae plus minus. [illegible]

Das hab Ich dem Herrn [illegible] und frdtl. willen zu erweisen allezeit gewogen.

Datum München, den 27. Nov. 1605.

Des Herrn [illegible]

Observationem eclipsis [illegible] Tychonis Brahe [illegible] integram [illegible] Keplero ipso adscriptas. [illegible]

Observatio eclipsis Solis a. 1605, 2. Octob. [illegible]

Horologium pro intercapedinibus; nam ex altitudine [illegible]

Horologium post merid.	Correcta	Altitudo	[illegible]
H. M.	H. M.		
0. 44	[illegible]	[illegible]	[illegible]
0. 50		[illegible]	[illegible]
0. 52½	1. 15	[illegible]	[illegible]
0. 56		[illegible]	[illegible]
1. 2		[illegible]	[illegible]

Cum lucida pars propter [illegible] omnia et ponam veram partem [illegible]

1. 9		[illegible]
1. 20		[illegible]
1. 24		[illegible]

[illegible]

1. 37 [illegible]

Primum quod tempus attinet. Observator [illegible] quam in literis [illegible] addidit ubique 23′ ad [illegible] correctionis [illegible] observatis altitudinibus.

Phasi secundi.

Compl. declinationis ☉ 82° 20′ 48″ — 7° 30′ 17″ Alt. ☉ [illegible]

Alt. aeq. 38. 20 38. 20

120. 57. 45 — 36. 58. 17 — 71[illegible] [illegible]

36. 57. 48 51[illegible] [illegible]

1[illegible]

64674

$$\frac{120880}{61674} = 195188;\ 95188 = \text{sin. } 72^\circ\ 9'\ 12''$$

17. 50. 48 h. 1. 11. 28

Horolog. 0. 50

Differentia 21′ 23″

Computus temporis finis.

Alt. ☉ 25° 45′ — 40275

71[illegible]

112474

$$\frac{112474}{61674} = 1[illegible];\ [illegible] = \text{sin. } 54^\circ\ 56'$$

35. 2. h. 1. 20′ 8″

Horolog. 1. 0

Differentia 20. 8″. Ergo observator altitudini addidit adducus 23′, debuit tantum 20′, quia [illegible] altitudinibus [illegible], quam [illegible], quae parum variantur.

[illegible] de inclinationibus circuli [illegible] [illegible], magnam esse [illegible]; non enim diligens [illegible] observator. [illegible] valde [illegible] observandi. [illegible] esse dextra in tabella, quae dextra sunt in coelo, [illegible] [illegible] [illegible] in dextrum [illegible] [illegible] [illegible] Lunae. [illegible] in literis inclinatio initialis [illegible] [illegible]

[illegible]

ipsi 43 et pro eo scribere 40. Ut in 4' ...
13° fieret, ad illam exactam observationem 60, ...
scribatur 72° pro 71°. Indè per ... eo sunt ... saltus per trina minuta ...
79 pro 77. Succedunt 5', quibus ... 2', ...
dimidium et scribatur 81½ pro 74, ...
82 ..., sequentibus 5½ detur 1 et scribatur ...
tur 84½ pro 80, ... pro 83.

Typus correctionis

Scripti: 0. 5 sin. 7 dext. 43. 47. 60. 71. 79. ...

Correcti: 0. 5 sin. 7 dext. ... 47. ... 75. ...

Adscripsit observator ... de quantitate sui digiti. Nam in circulo ... in digitos 12, sed totus Sol ... digitos omnes residuos. Verbi causa ... enim dividimus in 12) quid valeat 2½? ...
Ergo fimbriatae speciei Solis ... in literis posita est quantitas ...

In principio schedae tribuitur ...
90 ...

Longitudo visa ☽ a ☉ in fine eclipsis.

Ex Praecepto Rudolphi.

ad occasum

Latus aequat. 37. 21 — 49975
Alt. „ 38. 28 — 47472 — 24496
97447 — 7660
57. 43 —— 16786
28. 31½
81. 14½ —— 1173
90650 — 5555
69. 34 — 6467
Nonag. 20. 26 ♎

[illegible]

A.R. ☉ 197. 37 Competens loco ☉ in conjunctione vera, quod passum licet etiam in fine usurpari.
Tempus
p. m. [illegible]. 2
242. 39
Asc.obliq. [illegible]. 39 Cooritur 20. 39 ♑
Nonages. 20. 39 ♎

Luminaria sunt in quadrante occidentali

Pro angulo inter eclipticam et verticalem.

Angulus hic supra ad sinistram est paulo minor recto, infra paulo major. Inquiritur hic facile ex data Solis altitudine et distantia ejus a Nonagesimo.

Alt. ☉ 23. 45 Tang. 44591
Compl. dist. ☉ a Nonag. 88. 27 Tang. 3695600

$$\frac{44591}{3695600} = 1190 = \text{sin. compl. anguli } 0.\ 41$$

Angulus infra. 90. 41
Aufer angulum inter diacentron et verticalem 85. 0 [illegible]
Angulus inter diacentron et eclipticam 5. 41 [illegible]

Diametri et contactus.

Etsi observator habet diametrum ☽ 32′ 40″ [illegible], tamen illa 33′ 32″, quantam statuo in ultima conjunctione [illegible]. [illegible] habet tantum 26″ plus observato, quod [illegible]

[illegible] ☉ 15. 16
[illegible] ☽ 16. 46

Distant. centror. 32′ 2″ vel 31′ 56″ observatum.

[illegible] angulo 5° 41′ respondent [illegible] inter centrum ☉ [illegible] vel [illegible] 31′ 57″ [illegible] 31. 57 — 3. 16 — [illegible]

[illegible]

Pro angulo inter ecl[illegible]

Alt. ⊙ 29°

Compl. dist. ⊙ a Non. 72. 58½.

$\frac{55431}{326[illegible]}$ = 16976 = sin. 9° 4[illegible]

Est igitur anguli [illegible] ad [illegible] tram versus occidentem 99° [illegible] tram, cum desuper in radio spectaret [illegible] sc. ad occidentem. Aufer [illegible] diacentron et eclipticam est 85° 14', jam [illegible] ultra Solem.

[illegible] fuerunt igitur 3' 36".

Adde residua 3. 36 ad [illegible]

Lat. [illegible] 51. 47 | 51. 47

[illegible] 5. 16 | 4. 50

Reductio ad meridianum Uraniburgicum.

Hondius Londino dat long. [illegible]

Uraniburgo [illegible]

Differentia [illegible]

Ergo quod est Londini h. 1. 25. 30

[illegible]

id est Uraniburgi h. 2. 22. [illegible]

Calculus Tychonis dat h. 2. 13. 37. Tabula [illegible] habet inter Uraniburgum et Calesium 40'. Huic [illegible] Londinum [illegible] 16 [illegible] 64. Sed [illegible] perperam, quia non sunt [illegible] 12°. [illegible] Uraniburg. et Londinum 12° 45' [illegible], quae sunt 51' [illegible]

In literis ad Nautonnerium et Colignetum datis Keplerus [illegible] ea, quae [illegible] suo spectaverit, quam ob rem literas ad utrumque datas subjungimus, omissis iis, quae p. [illegible] ex literis ad Nautonnerium excerpsimus.

Haec igitur scripsit Keplerus Nautonnerio:

Illustrissime Domine! Liber tuus idiomate Gallico conscriptus Pragam quoque importatus est, et in bibliothecas doctissimorum virorum, quos habet [illegible] Caesarea, acquisitus. Ejus mihi legendi copiam fecit [illegible] Wackherius a Wackenfels, S. C. M. a consiliis aulae imperialis. Quo [illegible] totum evolverim impedimento fuit idiomatis perfecta cognitio, vel [illegible] a Gallis pueris in Germania [illegible] vel usu librorum [illegible]. [illegible] epistola, in qua lectores alloqueris, valde [illegible] quo [illegible] uterque negotium agimus, [illegible] ego [illegible] et dignam tuam petitionem judicavi, [illegible] in me [illegible] haret, et maxime te idoneum, cui vicissim meum negotium [illegible] quidem ex animi sententia confecto, [illegible] ad tuum [illegible]

[illegible]

[illegible] et methodum meam [illegible] removeam, atque inde ex principio et fine [illegible] ferentiam longitudinum elidam. Hoc modo [illegible] eclipsin superioris Octobri [illegible] [illegible] habes exemplum) ex Londino Angliae [illegible] didici diff. long. inter 11° et 12° citra [illegible] [illegible] quam chartae 16°—1[illegible]° faciunt. [illegible] est, [illegible] observata; [illegible] satisfecisset. [illegible] in Anglia observavens h. [illegible] diff. h. 1. 7′ dat sane 16¼°, si non [illegible] parallaxin Luna mihi occidentalior est facta [illegible] Solem, ita vides minorem fieri differentiam [illegible] autem de 1° dubito causa est, quia Anglus [illegible] dium vero, quod ille prodidit ex inclinatione [illegible] [illegible] quam de 1° dubitatio plane nulla est. . . .

. . . . Interim commendo Tibi [illegible] [illegible]. Literas, si quibus me [illegible] [illegible] via Parisiens[illegible] [illegible]

[illegible]

[illegible] mihi est dubitatio, [illegible] [illegible]. Pulchre consentit observatio tua cum Anglicana [illegible], si [illegible] longitudinum (quae non potest non esse [illegible] propter navigationes [illegible]) et una parallaxin Lunae a Sole utroque [illegible] [illegible] applices. [illegible] utraque si cum mea observatione [illegible], cujus descriptam publicis typis excusam tibi transmissam puto, intervallum Pragam inter et utrumque locum valde breve efficitur. Ecce typum operationis; posita parallaxi horiz. ☽ a ☉ 58′ 33″, in alt. poli 50° 5′ hora 1. 6′ fit parall. long. 8′ 33″ in ortum; simul autem adscitis diametris ☉ 30′ 30″, ☽ 32′ 59″ et summa semidiametrorum 31′ 45″, in principio Luna visa est ante Solem 30′ 40″, et addita parall. long. 39′ 13″ vere ante ☉. Ad [illegible] modum posito, quod azimuth Solis [illegible] praecise in ipso eclipsis principio, neque fortasse paulo tardius, ut fieri solet, ergo h. 0. 33′ in alt. poli 51° 12′ parallaxis ☽ a ☉ in ortum est 14′ 14″ major quam mihi, quia Luna etiam longius abest a nonagesimo. In principio vero eclipsis Luna pene ut mihi visa est ante Solem stare 30′ 40″, ergo addita parallaxi in universum 44′ 54″ vere ante Solem fuit. Oportet tempus eligere, quo tempore Pragae quoque ☽ per 44′ 54″ fuerit ante ☉, nempe 5′ 41″ [illegible] quam in Pragensi principio; tunc enim [illegible] per [illegible] fuit ante Solem. Cum autem [illegible] ☽ a ☉ sit 34′ 10″, ergo 5′ 41″ confecta sunt per 10′ temporis; itaque h. 0. 58′ Pragae Luna ibi fuit, ubi h. 0. 33′ Antwerpiae [illegible], quae faciunt 6° 15′. Eodem pacto [illegible] inter Pragam et [illegible] paulo minus [illegible]. [illegible] observatione [illegible] prodiit 12° 40′, ex finis observatione pene idem. Coepi itaque credere, tabulae geographicae Germaniae ad litus oceani et per Saxoniam [illegible] nimiam [illegible]. [illegible] eclipsis alia Lunae, [illegible] quae 3. Apr. contigit. Ejus initium hic Pragae fuit 14′ [illegible] quam [illegible] attolleretur 8° 33′, cessavit 59′ postquam Spica fuit alta 24° 1′. [illegible] colligitur medium h. 9. 17′ [illegible] in Ostfrisia meridiano [illegible], [illegible], cujus alt. poli [illegible] initium in alt. [illegible] in alt. Arcturi 46° 25′ (comp. II. [illegible]), itaque duratio prodit [illegible]

[illegible]

[illegible]

Proponentes lectoribus opusculum, quod [illegible] quam raro illud occurrere in bibliothecis [illegible]

AD RERUM [illegible]

AMATORES [illegible]

[illegible]

[illegible] hoc igitur exemplo claruit primum Hipparchi [illegible], qui in [illegible] Macedonicorum aestuum tumultibus per [illegible] [illegible] umbras Lunaris indagavit, cum esset astronomiae [illegible] [illegible].

Consideratis amplius, nequaquam ista perfici aliter potuisse, [illegible] reges Asiae, Macedoniae, Aegypti, quamvis tunc de rerum summa inter sese [illegible] certamina acerrime terraque et mari grassantes; in unius tamen privati hominis vota unanimes consensissent itaque tutum illi artis praeclarissimae studio praestitissent, forsan et sumtibus juvissent.

Jam vero ad haec nostra revoco tempora, quibus post jacta per Tychonem Brahe solidissima fundamenta id unice agitur, ut astronomiam quam perfectissimam habeamus; et quod meam partem attinet, tempus forsan et [illegible] adminicula mihi defuerint, animus certe nunquam deest; [illegible] [illegible] praebuit, observationes adsunt in copia, quales quaevis temporum et [illegible] conditio exhibet: sola haec Hipparcho usurpata occasio hactenus defuit, ut per defectum Solis diversis locis accurate observatum eadem investigarentur expeditius, quae aliunde quoque innotuere per longiores ambages, itaque consensus veritati praeberet testimonium. Quodsi seculum [illegible] contemplamur, rarissimas videbimus hujusmodi occasiones.

Anno 1544 magna fuit eclipsis et alicubi totalis et mediocriter adulto die; cumque, ut Gemma Frisius adnotavit, inferior Solis pars defecerit Lovanii, meridionalibus igitur locis alicubi totus Sol post Lunam latuit. Magna opportunitas, sed neglecta, forte quod tunc astronomiae restauratio non ita ferebat, observationibus accuratioribus nondum consignatis.

Anno 1560 eclipsis Solis et totalis et in meridie fuit in Lusitania, et observata est passim per Germaniam, digitorum tamen numerus sola [illegible] [illegible] nullo artificio proditus, itaque non majorem ad certitudinem [illegible] [illegible] apta est, quam Hipparchum eo perduxit [illegible] [illegible] 1567 secuta est, [illegible] in [illegible] centralis, astronomus in [illegible] [illegible] [illegible] [illegible] [illegible] in Opticis mea explicavi cap. VIII. [illegible] [illegible] [illegible] [illegible] Sperant autem [illegible] [illegible] [illegible] [illegible] Christophorus Clavius [illegible]

[illegible]

comparata, ut vobis, viri docti, interp...
posuit, quae hodie ... ab astro...
Galliae praesertim et Hispaniae; deinde ...
Solis partem texit, ut impossibile sit, quod ...
alicubi in Gallia vel Hispania, ubi pax, ...
imperia, quae facilis vobis rei investigatio, ...
denique Luna fuit loco Terris pene proxima, ubi ...

Haec cum ita habeant, equidem opto ...
illa loca suscipiendi passimque omnes ...
praesentem veniendi. Qua potestate ...
per haec stupendae divinae sapientiae opera ...
obligati, per amorem posteritatis, per vestram ...
losophi jam olim non absimili studio, atque ...
secro atque obtestor, uti hanc levissimam ...
et quae quisque vidit, quae memoria ...
indoctis, modo fide dignis audivit, imo ...
dedita opera explorare etiamnum poteris, ...
recens est memoria, veredariis committat ...
et Principum vestrorum legatos ubi praec...
furtum ad Claudium Marinum indeque ...

Sunt autem capita quaesitorum haec ...
ticula in supremo Solis margine ...
quibus vicissim aliquo in imo margine ...
tectus; tum quae facies diei ...
Solem circumfusi, an integer circulus ...
minatus intra et extra ...
Sole tecto consistentis color; ...
praeter istam admonitionem ...
narratio, dummodo fida et candida, ...

Equidem et spero et fatentur omnes, totum hoc et quae superstruere cogito, Deo conditori, cujus de gloria agitur, fore gratissimum.

Si quis paulo iniquior insanire me clamabit, qui orbem Terrarum longe gravioribus occupatum negotiis e solio regio ad meos pulveres geometricos detraham, ratus scilicet, ad hoc conditum esse genus humanum, huc referendas omnium cogitationes, ut agro colendo se mutuo expellant, sanguinem mutuum fundant, alter alterum servituti mancipet, Dei vero perennia isthaec opera et hanc scientiam vel rideant vel probro habeant et quasi quoddam dedecus aut aperte fugiant aut privatim occultent: hujusmodi objicientibus equidem aliud quod respondeam non habeo, quam quod olim Diogenes dolium suum versans deteriori quidem jure respondit: scilicet in tanto universorum fervore, tanta suarum actionum fiducia, me quoque a partibus instaurandae astronomiae stantem aut non oportuit aliter facere, aut quid me aliud oportuerit facere, neque ego, neque consultores mei intelleximus. Veniam itaque dabunt imbecillitati nostrae. Valete et ne mihi sumtus et opera frustra perierit, crebris responsorum nimbis efficite. Pragae Bohemorum, Martinalibus anni 1605.

Observatio Defectus Solis,
qui contigit die 12. Octobris anni hujus 1605, Pragae Bohemorum habita.

Nox praecedens pluvia fuit et mane turbidum. Hora tamen [illegible] [illegible] nubes et Sol per unam atque alteram horam purus luxit. Principium [illegible] ex azimuthio et horologio Tychonis primorum et secundorum [illegible]. [illegible] animadverti in tabella clare, cum nemo qui Solem [illegible] quicquam animadverteret. [illegible] perpetuam, [illegible] in [illegible] minimo defectu [illegible], ut in Opticis [illegible].

Inclinatio instrumento ostendebatur paulo [illegible] medium [illegible]. [illegible] ergo angulus inter eclipticam et circulum per centra 85° aut plus, in [illegible] Luna fuit Sole [illegible], ut in Opticis docetur, et angulus [illegible] paulo minus. Angulus vero inter eclipticam et verticalem per Solem [illegible]

diameter sit 30′ 32″, quantam fere [illegible]
[illegible], sic [illegible] ad 14′ 6″ [illegible]
[illegible] semidiametrorum relinquunt [illegible]
[illegible] tunc inclinatio 39°, umbra [illegible]
igitur in coelo et angulus 111°, unde [illegible]
25′ 44″, quare parallactica meorum Opticorum [illegible]
Lunae a Sole in ecliptica, et 7′ 31″ [illegible]

Lunula mea habens particulas 74, quae [illegible]
bant summam 91 ½, et deficientes [illegible]
fuit multo minor justo. Lunae ergo [illegible]
major igitur Solari. Eclipsis igitur [illegible]
pore diametrum hanc Lunae exacte [illegible]
densissima nubes diutius integra hora Soli [illegible]
eripuit, campis circumcirca [illegible]
tempore expectata occasione frui non [illegible]

Hora 3. 13′ 30″, quae in hac [illegible]
inter eclipticam et verticalem versus orientem [illegible]
rursum nonnihil dehiscentibus nubibus digiti [illegible]
radio, aut eo minus aliquid, scilicet [illegible]
9′ 6″, et haec a summa semidiametrorum 3[illegible]
tiam centrorum 22′ 41″ et plus [illegible]
fuere. Inclinatio fuit 85° a supra, ergo [illegible]
Sole; aufer 81° 30′, remanet [illegible]
quibus indicatur latitudo plus quam 3′ [illegible]
distantia ecliptica a Sole [illegible]

Hora 3. 30′ [illegible]
amplius [illegible] defectum [illegible]
et initio [illegible] in Sole [illegible]
contemplaturum [illegible]

Hora 3. 34′ [illegible]
[illegible] defectus [illegible]

[illegible]

monstr parallaxin Lunae et Solis [illegible] quasdam in Hipparcho meo consecutus, paruit enim [illegible] etsi uno aut altero scrupulo plus minusve [illegible] doctrinam meorum Opticorum Cap. IX. [illegible] parallaxes in hunc modum:

Phas.	Longitudinis.		Diff.	Latitudinis.	Differ.
1.	In ortum:	8′ 08″	4′ 52″	49′ 32″	1′ 48″
2.	In ortum:	3. 44	Summa	51. 20	
3.	In occasum:	7. 44	11. 25	54. 51	3. 31

Cum igitur horarius Tychonis sit 34′ 10″ et primo intervallo competat portio 19′ 39″, secundo 52′ 07″, parall. long. aufert illic 4′ 52″, hic 11′ 25″, manetque illic 14′ 47″, hic 41′ 32″; nos vero habemus 14′ [illegible] 39′ 40″. Ergo apparens noster horarius est minor Tychonis; id [illegible] causa vitiose assumtae parallaxeos, unum enim vel alterum [illegible] differentias nihil sensibile accumulat; nec peccavimus assumtione majoris diametri Lunae, quam est Tychonica, cum potius nobis profuerit etiamnum augere Lunae diametrum, et Tychonica hic applicata augebit hoc horariorum dissidium; sed sunt causae quaerendae alibi.

Jam latitudinis consensus exquiritur. Parallaxes lat. hae fuere:

	[illegible]	51. 20.	[illegible]	
Aufer	5. 16 c.	7. 31.	5. 10 +	latitudinem apparentium, sub
Restat	44. 16 c.	43. 49.	49. 41 —	vera latitudo.

Hic si parallaxis totam [illegible] vera [illegible]. Habet [illegible] intervallo primo [illegible] 2′ 33″ [illegible]. Nam si ad [illegible] Tychonis [illegible] deris motum Solis, ut sit motus Lunae a nodo 18′ [illegible] et 47′ [illegible] invenies latitudinem variandam [illegible]. [illegible] itaque scrupulis abundat [illegible] incrementum. [illegible] indeterminata, incli- [illegible]

[illegible]

... argumentur ... quantitas ... Solis 6′ 19″ ... distantia ... supra ... det ... 3′ 49″ plus, quod convenit superiori argumentatione deductae; quod est unum argumentum. Deinde ... rium Tychonis. Nam ... quam apparentem ... habuimus plus quod compararemus, quam 30′ ... mum. Hic jam ex 22′ 5″ plus ... 24′ ... nostro tam parvo horario, ut ... 40′ 49″ plus ... servatum tenemus rectius. Cum enim hoc ... 6′ 29″ minus, et horis 2. 8′ jam ... 6′ 26″ minus analogon ... ultimae phaseos 3. 13′ 30″, ... In hac igitur incertitudine ... nobis ...

Quando ...

Medium illud est, ... per centrum Solis traducto.

Quandoquidem igitur h. 1. 40′ ... igitur ex analogia motus, qui ... 15′ 57″ ... 87′ ... medium h. 2. 18′ ...

Duravit igitur a ...

Quantitas eclipsis.

Latitudo visa ex supra dictis in medio proportionaliter [illegible] 6′ 0″; sit autem 6′ 30″. Haec ablata a summa semidiametrorum [illegible] relinquit scrupula obscurata 25. 17″, quae faciunt digitos [illegible]. Superfuerunt digiti 2. Et tamen cum Pragam inter et Solem [illegible] nubes esset, coelo circumcirca patenti, campis illustratis, lumen [illegible] notabiliter fuit imminutum, quasi advesperasceret aut praegnans imbre nubes totum coelum occupasset; credibile igitur, ubi totus Sol tectus, [illegible] fuisse noctem.

In ipso verae conjunctionis articulo ubi Sol totus fuerit tectus?

Ad hoc nobis opus est cognitione verae latitudinis Lunae. Ac cum hactenus usus sim parallaxi ex Hipparcho meo, utar jam quoque. Sed duplicem is exhibet hoc situ Lunae parallaxin, alteram sub conditione anguli inter plana eclipticae et viae Lunae 4° 58′, alteram, si hic angulus [illegible] sumetur quadrantali latitudine Lunae 5° 17′ 30″, quam suspicionem foveo. Illa est 58′ 13″, haec 62′ 16″. Itaque si [illegible] apparentem in medio latitudinem 6′ 30″, vera latitudo prodibit vel 46′ [illegible] vel [illegible] 44″. Hipparchus meus vult illic 48′ 5″, hic 49′ 57″. *) Confirmat igitur [illegible] eclipsis angulum magnum.

Cum igitur h. 2. 15′ Pragae fuerit vera conjunctio, quae horae faciunt 33° 45′ tempora, igitur in meridiano, qui est occidentalior Pragensi per 33° 45′ fuit tunc meridies, et cum declinatio Solis sit 7° 30′ austr., [illegible] in latitudine loci 7° 30′ australi fuit Sol verticalis. Is igitur locus fuit in oceano Atlantico, vel Guineae, [illegible].

Hic igitur terminus est, a quo [illegible]. [illegible] minime fuit; Luna [illegible] 48′ [illegible] vel 49′ 44″ [illegible].

Centro S, quod [illegible] Soli [illegible] circulo [illegible] [illegible] PR, [illegible] in quo sit [illegible] subjectus [illegible] est 49° 6′ ♎, sit igitur A 0° ♎, et AT [illegible]



[illegible]

[illegible]

Tycho Brahe justiorem prodidit latitudinem, quam [illegible]

[illegible]

S transire. Jam vero declinat ab S et [illegible]

[illegible]

ne ex S cogamur [illegible]

[illegible]

37', complementum ad priorem, [illegible]

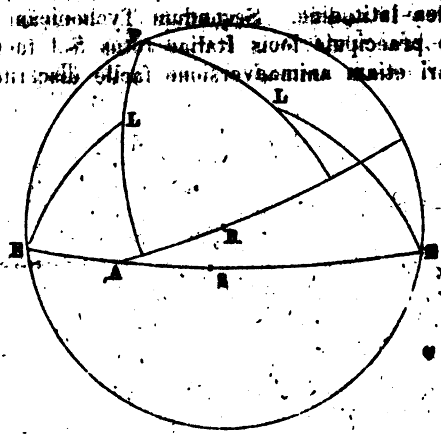
longitudinem LM, LN sub [illegible]

ergo moratur [illegible]

[illegible]

[illegible] , [illegible] quam Praga. Illic igitur [illegible] prope Havanam, hic oceanus orientalis prope [illegible]gascar [illegible] et S. Mariae. [illegible]

In figura sequenti [illegible] EP, polum Terrae P [illegible] A sub [illegible] Solis, tractus ASE [illegible] S sub Sole, sitque [illegible] S sit in oceano post [illegible] E sinistram in Cuba, [illegible] eclipsis nulla, quia Luna borealis [illegible] Ducatur arcus circuli magni EL, rectus ad ES, quo toto tractu Sol spectatur oriens. In eo tractu punctum L sit locus, ubi Luna sub Sole, et connectatur LP. In triangulo igitur LEP datur EP 67° 51′ ex declinatione 19° ♋, et LEP 8° 5′ ex tabula anguli eclipticae SE et meridiani EP, et LE invenitur per initialem latitudinem Lunae, quae itinere 35′ 15″ vel 37′ 28″ a Sole, h. e. 37′ 50″ vel 40′ 10″ a nodo per 3′ 13″ minor fit quam in medio, quare vel 43′ 17″ vel 46′ 31″. Haec inquam latitudo absorbetur a parallaxi, cum ab E per 48° itur in L. Tribus itaque cognitis et PL patebit 21° 53′, et EPL 14° 54′. Fuit autem E inter et Pragam 105° 11′ vel 104° 11′, ergo inter L et Pragam est 90° 17′ vel 89° 17′, et lat. L 68° 7′, quibus describitur zona frigida, Americae incognita pars sub meridiano Hispaniolae. Sic in figurae dextra parte, quae servit fini, sit E post Madagascar, S in Brasilia; datur PE 112° 20′ ex declinatione 19° ♑, LEP iterum 8° 5′, EL 58° 30′, quia in tanta discessione ab E parallaxis aequat ☽ lat. 49′ 33″ vel 53′ 9″ (quae rursum per 3′ 13″ differt ab ea, quae in medio, major jam, sic exigente motu Lunae), datur ergo PL 54° 12′ et LPE 8° 50′, [illegible] 42° 49′ differentiae long. Pragae et E, manet [illegible] L 35° vel 34°, lat. 35° 47′, qualem habet Mesopotamia et [illegible] Antiochiam Syriae versus orientem sequuntur. [illegible]



[illegible]

[illegible] per Rhodum [illegible] Antiochiam [illegible]
[illegible] deseruit, [illegible]

Quicquid igitur Terrarum ab hoc limite in [illegible] Italia et tota fere Europa, [illegible] aliquid de Sole [illegible] visa est, [illegible] medium eclipseos [illegible] vero in austrum, ut Hispania ultima, hoc [illegible] versus austrum vidit distantem, et cornua [illegible] mea latitudine. Secundum Tychonicam vero [illegible] in praecipuis locis Italiae totus Sol fuerit [illegible] lari etiam animadversione facile discernuntur.

OPERUM KEPLERI

QUAE VOLUMEN III. CONTINET DISPOSITIO.

CONSPECTUS

EPISTOLARUM KEPLERI,

QUAE INSUNT VOLUMINI III.

" " " " d. 20. Dec. 1604
" " " " d. 14. Dec. 1604
" " " " d. 5. Mart. 1605
" " " " d. [illegible]
" " " Lincii d. [illegible] Dec. 1616
" " " " d. [illegible]

Magimum d. Pragae d. 1. Jan. 1601

" " " d. 1. Febr. 1610

" " " d. [illegible] Mart. 1610

Naujoemarinum d. Pragae d. [illegible] Feb. [illegible]

Odontium d. Graecii d. 5. Aug. [illegible]

Pistorium d. Pragae d. 12. Jan. [illegible]

Praesidium curiae Imper. d. Pragae d. [illegible]

Remum d. Pragae d. 16. Mart. 1612

" d. Lincii Oct. 1619

Zieglerum d. Pragae d. 14. Feb. [illegible]